

EDUCATION

Southern Methodist University - B.S. in Mechanical Engineering, 1972

University of Oklahoma - Master of Business Administration, 1975

PROFESSIONAL LICENSES

Licensed Professional Engineer in the State of Texas

Licensed Professional Engineer in the State of Tennessee

Licensed Professional Engineer in the State of South Carolina

MEMBERSHIPS

National Society of Professional Engineers (President 2012-2013 and Fellow)

National Engineers Week Foundation Board of Directors (Member 2013 – 2018, President 2017-2018)

Texas Society of Professional Engineers (President 2002-2003)

American Academy of Environmental Engineers (Diplomate, General; Member Board of Trustees, 2010-2015)

Solid Waste Association of North America (SWANA) and Texas Solid Waste Association of North America (TxSWANA)

CERTIFICATIONS

Radiation Safety Officer (1985 to present)

Registered Environmental Manager (1994-2003)

EXECUTIVE PROFILE

Dan Wittliff, P.E., DEE, F. NSPE serves as Managing Director of Environmental Services with GDS Associates, Inc. in Austin, Texas. In this role, he keeps complex and multi-media (e.g., air, water, wastewater, and solid waste) environmental projects on schedule and within budget. Mr. Wittliff maintains regular contact with the client, regulatory agencies, engineers, and contractors involved in a project. Because of his experience in government and industry, Mr. Wittliff is a skilled consensus builder who proactively engages the community on behalf of clients to address relevant issues early and economically.

Prior to joining GDS, Mr. Wittliff was Principal of Dan Wittliff Consulting, PLLC. This firm provided professional engineering services in environmental engineering, regulatory affairs, and energy systems. Prior to starting his own company, Mr. Wittliff served as Vice-President and Chief Operating Officer of HydroProcessing, LLC, the Austin-based technology company that has developed patented and proprietary technology for the conversion of municipal, agricultural, or industrial organic sludge into useful products or power.

From 1995 through 1999, Mr. Wittliff served as the first Chief Engineer for the Texas Natural Resource Conservation Commission (TNRCC, now TCEQ). Upon leaving TNRCC, he worked with Naismith Engineering, Inc. for two years providing consulting services to a wide array of industrial and municipal clients. Before service with TNRCC, Mr. Wittliff served in several supervisory positions with West Texas Utilities Company, Abilene, TX managing and monitoring power station performance to include issues related to air pollution, water treatment, industrial hygiene, and solid waste disposal. Mr. Wittliff is also a frequent speaker at engineering and trade association conferences and seminars and has published articles in industry journals. On behalf of his clients, he is an advocate for cutting edge technology to improve operation, compliance, and finances. He also serves on the Board of Advisors to the

Environmental and Civil Engineering Department of Southern Methodist University where he taught a graduate course in construction management. In May 2017, the SMU Board of Trustees approved Mr. Wittliff to serve on the Lyle School of Engineering Executive Board.

Wittliff retired in 2002 from the United State Air Force Reserve at the rank of colonel. His active duty career included a stint as the commander of communications organization on a mountaintop in Central Turkey. His military awards and distinctions include the Legion of Merit, Meritorious Service Medal with five oak leaf clusters, Outstanding Graduate of Air War College, and the Air Force Communications-Electronics Professionalism Award.

The National Society of Professional Engineers (NSPE) House of Delegates elected Dan Wittliff, P.E., Fellow NSPE, DEE as President in 2012–13. Wittliff also received the 2010 President's Award for his work in leading the Software Engineering Licensing Consortium, an effort to provide software engineers with a path forward to licensure. He became the first two-time recipient of the President's Award in 2016 for his work in forming and leading the NSPE Committee on Policy and Advocacy (COPA) to assume and streamline the work previously done by two long standing NSPE committees, LQPC and LGAC. In 2018, Wittliff received his third President's Award for his work as Chair of COPA.

Since joining NSPE in 1972, Mr. Wittliff has served in various leadership positions including president of the Abilene Chapter and the Texas Society of Professional Engineers where he was honored as Engineer of the Year in 1998 and Distinguished Engineer of the Texas Engineering Foundation in 2001. He was made a Fellow of NSPE in 2004. In July 2017, NSPE awarded Mr. Wittliff the NSPE Award, the society's highest honor, for his "outstanding contributions to the engineering profession, the public welfare, and humankind."

PROFESSIONAL EXPERIENCE

Facility Permitting, Design, and Construction

Mr. Wittliff works closely with regulators and owners to permit and build facilities that: (1) comply with the law, (2) make good engineering and economic sense, (3) come in on schedule and (4) maintain regulatory compliance. Listed below is a sample of the permitting and construction work that Mr. Wittliff accomplished.

- ③ **Provided Testimony on Behalf of South Carolina Office of Regulatory Staff.** Beginning in 2017 and culminating with scheduled testimony in early 2019, Wittliff reviewed Duke Energy Progress's (DEP) and Duke Energy Carolinas' (DEC) plans to comply with EPA's Coal Combustion Residuals (CCR) Regulations and the North Carolina enacted Coal Ash Management Act (CAMA), and provided a high level technical assessment key questions regarding the prudence and potential negligence of DEP as well as the costs associated with the company's design, installation, and maintenance of CCR impoundments. Additionally, Wittliff was tasked with determining how much of the closure and remediation costs is attributable with CAMA compliance.
- ③ **Provided Testimony on Behalf of North Carolina Attorney General.** In 2017 and 2018, Wittliff reviewed Duke Energy Progress's (DEP) and Duke Energy Carolinas' (DEC) plans to comply with EPA's Coal Combustion Residuals (CCR) Regulations and the North Carolina enacted Coal Ash Management Act (CAMA), and provided a high level technical assessment key questions regarding the prudence and potential negligence of DEP as well as the costs associated with the company's design, installation, and maintenance of CCR impoundments.
- ③ **Review of Coal Ash Cost Recovery by DEP.** Earlier in 2016, Wittliff provided technical expertise to support coal ash cost negotiations with Duke on behalf of the North Carolina Eastern Municipal Power Agency and Fayetteville Public Works Commission, who are wholesale customers of DEP. More specifically, Wittliff reviewed Duke Energy Progress's (DEP) plans to comply with EPA's Coal Combustion Residuals (CCR) Regulations and the North Carolina enacted Coal Ash Management Act (CAMA), and provide a high level technical assessment key questions regarding the prudence and

potential negligence of DEP as well as the costs associated with the company's design, installation, and maintenance of CCR impoundments.

- ③ **Environmental Compliance Procedures and Training for Larsen Farms.** Prepared compliance procedures for environmental air permits for 20 MW power generation facility in support of 60,000-acre farming operation in the Texas Panhandle. Conducted operator training in those same procedures and permit requirements.
- ③ **Environmental Permitting for Larsen Farms Power Generation facility.** Prepared and obtained air construction and operations permits for 20 MW power generation facility in support of 60,000-acre farming operation in the Texas Panhandle. Also wrote Spill Prevention Control and Countermeasures (SPCC) Plan as well as compliance procedures.
- ③ **Environmental Compliance Audit of Larsen Farms Power Facilities.** Reviewed air, water, storm water, waste water, emergency response, storage tanks, and solid waste compliance posture for 20 MW facility in the Texas Panhandle. Audit was conducted in accordance with the Texas ECA Program rules and the applicable rules and ordinances in effect.
- ③ **Review of Environmental Issues Associated with Purchase of Cedar Bay Power Station.** On behalf of the Office of Public Counsel for the Florida Public Service Commission in Docket Number 150075-EI, reviewed documents regarding preexisting contamination at the brownfield site and Florida Power and Light's assessment of environmental risk. Testified orally before the Commission on salient issues that resulted in concessions from the Company to address.
- ③ **Environmental Compliance Audit of Marshfield Utilities.** Reviewed air, water, storm water, waste water, emergency response, storage tanks, and solid waste compliance posture for 60 MW facility in Wisconsin. Audit was conducted in accordance with the State's ECA Program rules and the applicable rules and ordinances in effect.
- ③ **Review of Environmental Issues Associated with Routing of 138 kV Transmission Line.** On behalf of the Hillwood Group, reviewed extensive documents associated with the routing of the Hicks-Elizabeth Creek CCN in North Texas. Submitted written testimony before the Texas Public Utilities Commission on SOAH Docket Number 473-14-2252 and PUC Docket Number 42087.
- ③ **Multi-Media Permitting for 49 MW Biomass Energy Project.** Managed agency contacts, environmental permitting, and public outreach for 49 MW biomass energy project in East Texas. Scope included new source review permitting, acid rain permitting, Title V operating permits, wetlands review, cultural and historic review, storm water permitting and pollution prevention, and waste registration.
- ③ **Assessment and Remediation of Lead Acid Battery Recycling Facility.** Oversaw and coordinated assessment, health effects, modeling, and environmental agency relations on \$45 million acquisition and remediation of 50-year old lead smelter. Evaluated pollution control technology options and prepared cost effectiveness analysis of different remediation options based on projected end land use.
- ③ **Greenhouse Gas (GHG) Compliance Reviews and Estimates.** Provided compliance reviews two large municipal solid waste landfills in Texas. Developed strategy and methodology for complying with USEPA regulations under 40 CFR 98, Subpart HH. Continued with GHG reporting to EPA in subsequent years.
- ③ **Review of Renewable Fuels for Industrial and Power Generation Projects.** Reviewed and evaluated landfill gas and biomass as alternative, renewable fuels for 15 MW landfill gas power plant and a 36 MW to 140 MW mixed fuels electric power projects in Missouri, 50 MW biomass power plant in Texas, 25 MW to 30 MW refuse derived fuel and landfill gas power plant, and a secondary aluminum smelter in Texas.

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- ③ **Multi-Media Permitting for Two 150 MW Combustion Turbine Projects.** Managed agency contacts, environmental permitting, and public outreach for two East Texas sites each with two 75 MW combustion turbines. Scope included new source review permitting, acid rain permitting, Title V operating permits, wetlands review, cultural and historic review, storm water permitting and pollution prevention, and waste registration.
- ③ **National Electric Reliability Council (NERC) Security Reviews.** Conducted physical and compliance reviews of six power stations with 27 generators capable of producing thousands of megawatts in electrical generation. Identified key security and reliability issues for resolution by owners and operators.
- ③ **Multi-Media Permitting for 24 MW Hydroelectric Power Project.** Managed agency contacts, environmental permitting, and public outreach for hydroelectric project located on 83,000 acre reservoir in East Texas. Scope included wetlands review, 401 Certification, water rights, endangered and threatened species for power project and associated 138 kV transmission line.
- ③ **New Source Review Permitting and Owner's Engineer for Organic Fertilizer Plant.** Wrote application for registration of innovative organic fertilizer plant under several permits by rule for air emissions. Negotiated with TCEQ on client's behalf the emissions limits and terms of the permit.
- ③ **Air Quality Review for City of Frisco, Texas.** Conducted a detailed assessment of air quality in southeast Frisco, Texas that involved designing an air sampling protocol to detect and quantify short-term excursions (peaks) of 226 gas and particulate concentrations downwind of two concrete and one hot mix asphalt batch plants. Trained citizens to collect air samples. Oversaw the collection of samples. Prepared a thorough report on analysis of results and likely health effects. Coordinated with TCEQ officials on the findings of the effort. Assisted the City in drafting an air quality ordinance that was later adopted. Assisted the City in responding to the USEPA changes to the NAAQS for lead as well as non-attainment area designation. Worked directly with leaders of USEPA Region 6 and TCEQ.
- ③ **New Source Review and Title V Operating Permits and Compliance for Nine Municipal Solid Waste (MSW) Facilities.** Provided essential support to permitting team and provided key testimony before state officials to secure a MSW permit for six landfills and three transfer stations. Wrote and secured from state regulators a standard air permits and permits by rule for these facilities. Modeled landfill gas emissions and developed a compliance timeline for relevant LFG control systems. Wrote application for a Title V Air Operating Permit for these facilities. Worked with client and legal team to resolve compliance and enforcement issues.
- ③ **Dismantling of Boilers 1, 2, 3, and 4 at Rodemacher Power Station, Lafayette, Louisiana.** Assessed regulatory issues associated with removing lead paint, asbestos, and PCB from four boilers between 45 and 53 years old. Oversaw the abatement and demolition as Owner's Representative. Coordinated resolution of contract interpretations with owner, contractor(s), and engineering team.
- ③ **Texas Emissions Reductions for Off-Road Diesel Engines.** Worked with TxSWANA legal team and Metroplex area members to craft a strategy for complying with an off-road diesel equipment ban while keeping area landfill operations open. Surveyed 47 DFW MSW facilities including: 17 landfills, 15 transfer stations, 6 composters, and 9 recyclers. Developed equipment counts and air emissions by facility type (345 Total): 228 at landfills, 32 at transfer stations, 57 at composters, and 28 at recyclers. Presented findings to Commissioner and senior staff at TNRCC.
- ③ **Environmental Due Diligence Reviews of Four Power Stations.** Conducted compliance and regulatory reviews for air, water, solid waste, wastewater, and safety at solid fuel and gas-fired power stations in Texas, Nevada, Utah, Louisiana, and Mississippi. Interviewed environmental regulators in the respective states to get a candid assessment of the compliance posture of each plant. Developed a risk and cost assessment for compliance issues.

- ③ **Payson Power Project, Payson, Utah.** Evaluated suitability of city WWTP effluent for use in cooling system of a 150 MW combined cycle plant. Worked with city and client engineers to determine availability and cost of surface and ground water for use in power plant. Worked with client's engineers and attorneys and represented client to the Utah regulators on a New Source Review Air Permit for the project.
- ③ **Environmental Services, West Texas Utilities, Abilene, Texas.** Managed the efforts of a professional environmental staff and a million plus dollar budget used in securing permits, determining fees, reporting compliance, and maintaining awareness for company's nine power stations, eight service facilities, and 1,100 employees. Supervised staff engaged in:
 - Air emissions, water rights, wastewater discharge, solid waste, and storm water permits;
 - Industrial hygiene and radiation safety;
 - Pollution prevention and emergency response, and
 - Coordinating with state's health and environmental agencies.
- ③ **Oklahoma Power Station, West Texas Utilities, Vernon, Texas.** Supervised plant engineering staff and oversaw the efficiency of systems and equipment at this 720 MW coal-fired plant. Conducted comprehensive acceptance and operations tests of steam generator, turbine-generator, cooling/heating apparatus, and other power plant equipment according to the national test codes. Developed management, performance testing, and operations procedures. Coordinated environmental compliance and radiation safety program. Participated in last two years of construction, initial unit start-up, and checkout.
- ③ **Power Plant Engineering, West Texas Utilities, Abilene, Texas.** Prepared support information and testimony used in fuel filing and reconciliation. Reviewed/evaluated contractor proposal for remediation of environmental problems. Served on Central and South West project team on standardized performance test procedures and online performance monitoring. Managed the company's power station performance testing program for 18 units in 8 locations. Co-authored the *WTU Environmental Policy Manual* and *Water Treatment Manual*. Managed computer retrofit of fuels measuring and monitoring at two plants. Responsible for performance efficiency of two gas-fired electric power units with a combined capacity of 362 MW. Developed engineering training manuals and supervised overhaul work at WTU plants. Managed company cathodic protection program. Wrote the company's power plant *Performance Testing Guide*. Supervised Fort Phantom Power Station Operations.

PUBLICATIONS AND PRESENTATIONS

- ③ Authored *Power Plant Performance Testing Guide*, West Texas Utilities, Abilene, Texas, 1983.
- ③ Co-authored *Environmental Policy Manual* and *Water Treatment Manual*, West Texas Utilities, Abilene, Texas, 1984-1985.
- ③ "Overhauling WTU's Largest Gas-Fired Power Plant," *The Electric Times*, West Texas Utilities Company, Spring 1984.
- ③ *From The Corners of My Mind*, A Collection of Poems by Dan Wittliff, 1993.
- ③ "Regulatory Advances in Texas," Workshop on Coal Combustion Products, American Coal Ash Association, Savannah, Georgia, April 1997.
- ③ "TNRCC Programs and Their Effect on Bio-Commercialization," *Biotreatment News*, DEVO Enterprises, Inc., August 1997.
- ③ "TSPE and the Texas Board: Partners in Mentoring", *Licensure Exchange*, National Council of Examiners for Engineering and Surveying, December 1998.
- ③ "Professional engineer development program in Texas upgrades staff capabilities," *Environmental Communique of the States*, Council of State Governments, January/February 1999.

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- ① "Multi-Media Permitting," Session Chair, Environmental Permitting Symposium, United States Environmental Protection Agency, Research Triangle Park, North Carolina, February 1999.
- ① "Engineering Ethics," Ethics Seminar, Dallas County Bar Association, Dallas, Texas, December 1999.
- ① "Effluent Trading: A Water Quality Control Strategy Whose Time Has Come," *The Texas Professional Engineer*, Texas Society of Professional Engineers, March/April 2001.
- ① "Organizing State Volunteers for Homeland Security," Several Occasions for Southwest and Central Regions of NSPE as well as 2002 and 2003 NSPE Annual Meetings.
- ① "Title V Air Operating Permit: The Saga Continues," Presentation to the Metroplex Chapter of TxSWANA on January 22, 2004.
- ① "Air Permitting for Landfills," Session Facilitator, Annual Meeting of TxSWANA on March 31, 2004.
- ① "Effects of Rule Changes on Air Permits for MSW Facilities in Texas," Annual Meeting of TxSWANA on June 6, 2006. "Ambient Air Quality Potential Health Risk Assessment in Southeast Frisco, Texas," for the City of Frisco, Texas in January 2007.
- ① "Trends in Homeland Security and Applying Homeland Security to the Nation's Electrical System," Annual Meeting of Louisiana Engineering Society on January 23, 2008.
- ① "LFG to Energy Alternatives," Annual Meeting of TxSWANA on April 1, 2008.
- ① "Comments on Proposed Revisions to 30 TAC 285, On-Site Sewage Facilities (OSSF), Rule Project Number 2007-033-285-CE," for Texas Society of Professional Engineers on May 1, 2008.
- ① "Results of Findings Regarding Garden Ville Composting Facility, TCEQ Docket Number 2006-1739-MLM-E," for Texas Landfill Management on August 15, 2008.
- ① "Results of Findings Regarding the Potential Inclusion of San Jacinto County in the HGB Non-Attainment Area," for San Jacinto County Commissioners Court, East Texas Electric Cooperatives, and Sam Houston Electric Cooperative on September 4, 2008.
- ① "Results of Findings Regarding Proposed Inclusion of Williamson County with Travis County in Austin-Round Rock Non-Attainment Area, TCEQ Docket Number 2008-1615-MIS," for Williamson County Commissioners Court on March 10, 2009.
- ① "Expanded Opportunity for MSW as Renewable Energy," Annual Meeting of TxSWANA on March 31, 2009.
- ① "Renewable Energy Projects," Annual Dual-State Meeting of the Louisiana and Mississippi Society of Professional Engineers on June 30, 2009.
- ① "Do Electrical and Electronics Engineers Need to be Licensed?" Seminar for the SMU Lyle School of Engineering on September 27, 2011.
- ① "Welcome to Wal-Mart: The Role of the U.S. P.E. in a Global Technology Market," Annual Meeting of Kansas Society of Professional Engineers June 2011 and Annual Meeting of National Association of Building Inspection Engineers February 2012.
- ① "Change and NSPE," *The Nebraska Engineer*, October 2012.
- ① "What Kind of Teacher are You?" *NSPE Professional Engineer* on October 2012.
- ① "Celebrating Our Public Servants," *NSPE Professional Engineer* on January 2013.
- ① "Creation of the Software Engineering Exam," Meeting of the Japan Society of Professional Engineers, Tokyo, Japan on June 14, 2013.
- ① "Partnering for the Future of America," *NSPE Professional Engineer* on April 2013.
- ① "National Science and Technology Policy," *NSPE Professional Engineer* on May 2013.

- ③ "P.E.'s and Public Policy," *NSPE Professional Engineer* on June 2013.
- ③ "Status NSPE Race for Relevance Implementation," Professional Engineers of North Carolina, Hot Springs, Virginia on June 27, 2013.
- ③ "On the Path to Remaking NSPE," *NSPE Professional Engineer* on July 2013.
- ③ "Ethics and the Professional Engineer," Two-Hour Seminars for the Senior Electrical Engineering Design Class at the University of Texas, Austin, Texas in 2014, 2015, 2016, and 2017. Also presented to the Wisconsin Society of Professional Engineers in 2013, Indiana Society of Professional Engineers in 2014, and GDS Associates Headquarters in 2015.
- ③ "Tried in Public: Tips for Engineers in Public Meetings and Hearings," Two-hour seminar for the Annual Meeting of the Texas Society of Professional Engineers in June 2017 in Austin, Texas.

EXPERT TESTIMONY

- ③ Expert Witness Testimony in the "Matter of Application of Duke Energy Carolinas, LLC For Adjustment of Rates and Charges Applicable to Electric Service in North Carolina North Carolina Utilities Commission in Docket No. E-7 Sub 1146 on January 19, 2018.
- ③ Expert Witness Testimony in the "Matter of Application of Duke Energy Progress, LLC For Adjustment of Rates and Charges Applicable to Electric Service in North Carolina North Carolina Utilities Commission in Docket No. E-2 Sub 1142 on December 4, 2017.
- ③ Expert Witness Testimony in the "Matter of Hicks-Elizabeth CCN Application (Texas SOAH Docket No. 473-14-2252", PUC Docket No. 42087) on June 17, 2014.
- ③ Expert Witness Testimony in the Matter of "Petition for Approval of Arrangement to Mitigate Impact of Unfavorable Cedar Bay Power Purchase Obligation, by Florida Power & Light Company," Before the Florida Public Service Commission (PSC) Docket NO. 150075-EI on April 21, 2015.

Exhibit 2.1 – Site Visit Notes - Asheville

Monday 12/3**Asheville**

Duke staff: Tim Hill, Matt Pickett, Chris Hallman

GDS staff: Dan Wittliff, Megan Morello

SC ORS staff: Michael Seaman-Hyunh, Liz Pardue

1. How many and how big are the units are on the site, when were they commissioned, and when did they or will they cease operations? **There are two 200 MW coal units, both still running. Unit 1 built in 1964, Unit 2 built in 1972. Both have scrubbers.**
2. How many CCR impoundments and landfills are on site, when were they built, and when were they decommissioned or closed? What is their capacity and how much is currently in place? **Two impoundments – 1982 pond (excavated, now site of combined cycle units under construction), 1964 pond (in use). Neither is lined.**
3. Please describe how ash and sludge are conveyed to the impoundments or landfills. **Much of the ash excavated (4 million tons) was used at the Asheville airport. The rest is being sent by Waste Management to their landfill in Homer GA (17 thousand tons per week). Some went to Cliffside as well. Ash is wet sluiced (both fly and bottom ash) into the 1964 pond. Scrubber gypsum is beneficially reused/sold, and effluent is treated onsite and then sent to public treatment, and cake sent to landfill.**
4. Were landfills lined with a Subtitle D compliant liner when they were built? Please describe the liners currently in place on plant landfills where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **N/A.**
5. Were CCR surface impoundments (ponds) lined when they were built? Have they been lined since? Please describe the liners currently in place on plant surface impoundments where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **Not lined.**
6. Please describe any issues that have occurred with seeps, leaks, or slope erosion on surface impoundments. What has been done to control, eliminate, or otherwise mitigate these issues? Were these seeps or leaks permitted under the NPDES program administered by the state? When were these permits issued? Are there any issues with discharge parameters that need treatment such as pH control? Please describe. **Constructed seeps are part of the NPDES permit. Non-constructed seeps are part of a special order of consent. Effective date 12/1/2018. The river is sampled upstream and downstream, quarterly. Sampling outflows for about 20 parameters.**
7. Please describe the closure plan and its associated schedule that have been submitted to the state environmental agency for each landfill or impoundment. What factors drove the choice of closure plan options? Please describe the costs associated with the closure plan for the closure action chosen and any other alternative closure options that were considered. **The 1982 pond is closed as of 2015. Work on the 1964 pond began afterwards – it's a priority site for 2019 per**

Exhibit 2.1 – Site Visit Notes - Asheville

CAMA (extended to 2022). Excavating now on the west side. Once the plant retires in 2019 after the combined cycle plant is up and running, then they can finish excavating and closing the 1964 basin and rim ditch. Clean finish means visually clean and samples to meet clean closure standards. Coal plant operation ends January 2020. Combined cycle plant comes online (goal) in November 2019. Scrubber sludge is dewatered by centrifuge, water is treated. Solar farm is being built as part of the Mountain Energy Act.

8. What issues to ground water drinking supplies have been caused by the seeps and leaks from the surface impoundments or landfills? What has been to address these issues?
9. Please describe the process where CCR is generated, conveyed, stored/disposed, or reused? Include the fraction of the CCR that is bottom ash, fly ash, economizer ash, and scrubber sludge and how much of each is stored/disposed or sold or beneficially reused. Where beneficiation exists or is contemplated for a site, please describe the following: (a) the process itself, (b) the rationale for choosing this technology, (c) the rationale for choosing this site, (d) the schedule of completing this project, and (e) the costs/performance associated with project.

Friday 12/7

Mayo

Duke staff: Issa Zarzar, Cedric Fairbanks, Lori Tollie

GDS staff: Dan Wittliff, Megan Morello

SC ORS staff: none

1. How many and how big are the units are on the site, when were they commissioned, and when did they or will they cease operations? **One coal unit, came on line in 1983, 715 MW. Out of outage as of earlier this week (outage started in September).**
2. How many CCR impoundments and landfills are on site, when were they built, and when were they decommissioned or closed? What is their capacity and how much is currently in place? **One unlined ash pond (140 acres, 6.6 million tons) – 1982ish. Within the footprint there is the FGD flush pond and settling pond since 2009. Landfill across the street was built in 2014, 460,000 tons of ash material, fly ash from the plant, some dredged FGD. Subtitle D compliant. Charah is doing the landfill work**
3. Please describe how ash and sludge are conveyed to the impoundments or landfills. **Dry fly ash, dry bottom ash. All Mayo ash goes to the landfill. Gypsum goes to Roxboro, vast majority to wallboard, rest may be off spec and go to concrete. In the landfill, they want open cells to have a small footprint. Leachate is thermally evaporated. There are liners on top to separate stormwater out so it doesn't become contact water.**
4. Were landfills lined with a Subtitle D compliant liner when they were built? Please describe the liners currently in place on plant landfills where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **Landfill is subtitle D compliant.**
5. Were CCR surface impoundments (ponds) lined when they were built? Have they been lined since? Please describe the liners currently in place on plant surface impoundments where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **Ash pond unlined when built.**
6. Please describe any issues that have occurred with seeps, leaks, or slope erosion on surface impoundments. What has been done to control, eliminate, or otherwise mitigate these issues? Were these seeps or leaks permitted under the NPDES program administered by the state? When were these permits issued? Are there any issues with discharge parameters that need treatment such as pH control? Please describe. **Identified seeps are covered in the SOC number 5, in August 2018. The 2 toe drains are constructed seeps, pumped back into the basin (closed loop system). August 1 2018 NPDES allows these because they don't go into river/creek. Permit renewal was submitted in 2009 or 2010. Meeting all standards, did not have to ask for relaxed limits. 1 million gallons total storage for leachate. NCG12 permit for stormwater ditches. AOW S-02 is the toe drain. AOW S-02 B is a seep. AOW S-03 in the woods is a sampling location, not a seep. AOW S-10 seep trickles into the creek/Branch. Outfall is effluent channel to the reservoir.**
7. Please describe the closure plan and its associated schedule that have been submitted to the state environmental agency for each landfill or impoundment. What factors drove the choice of

Exhibit 2.2 – Site Visit Notes - Mayo

closure plan options? Please describe the costs associated with the closure plan for the closure action chosen and any other alternative closure options that were considered. **Closure plan: cap in place. Did modeling for cap & hybrid closures, but regular cap is the most economical. Original submitted closure plan hasn't changed. Decanting per SOC starts in June 2019, they have a year and a half to do it.**

8. What issues to ground water drinking supplies have been caused by the seeps and leaks from the surface impoundments or landfills? What has been to address these issues? **Groundwater questions need to go to Kim/Jessica**
9. Please describe the process where CCR is generated, conveyed, stored/disposed, or reused? Include the fraction of the CCR that is bottom ash, fly ash, economizer ash, and scrubber sludge and how much of each is stored/disposed or sold or beneficially reused. Where beneficiation exists or is contemplated for a site, please describe the following: (a) the process itself, (b) the rationale for choosing this technology, (c) the rationale for choosing this site, (d) the schedule of completing this project, and (e) the costs/performance associated with project. **Dry fly ash, dry bottom ash. All Mayo ash goes to the landfill. Gypsum goes to Roxboro, vast majority to wallboard, rest may be off spec and go to concrete.**

Friday 12/7

Roxboro

Duke staff: Issa Zarzar, Jake Muessen, Lori Tollie

GDS staff: Dan Wittliff, Megan Morello

SC ORS staff: none

1. How many and how big are the units are on the site, when were they commissioned, and when did they or will they cease operations? **There are 4 units: Unit 1, 380 MW, built in 1966; Unit 2, 670 MW, built in 1966; Unit 3, 690 MW, built in 1973; and Unit 4, 711 MW, built in 1980. Scrubbers were installed in the early 2000s**
2. How many CCR impoundments and landfills are on site, when were they built, and when were they decommissioned or closed? What is their capacity and how much is currently in place? **The East Basin is no longer receiving ash. The West Basin was switched to in the 1970s. In the past, wet bottom ash was sold, but the market dropped. Saddle dikes were added in 1986, and the dam height was increased.**
3. Please describe how ash and sludge are conveyed to the impoundments or landfills. **In the 1980s, the plant switched to dry fly ash. There are 5 silos, 2-3 are sold, others are disposed of if off spec or over quantity that's sellable. Currently commissioning a submerged flight conveyor system (dry bottom ash).**
4. Were landfills lined with a Subtitle D compliant liner when they were built? Please describe the liners currently in place on plant landfills where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **Unlined landfill, lined landfill (40 mil LDPE), all CCR material except gypsum goes to the new lined landfill. Gypsum is temporarily stored above the ash stack pad (lined), then sold to wallboard. Gypsum is sent into a hopper and goes across the river to the wallboard plant. FGD basin is within the west ash basin.**
5. Were CCR surface impoundments (ponds) lined when they were built? Have they been lined since? Please describe the liners currently in place on plant surface impoundments where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **Basins were not lined when built.**
6. Please describe any issues that have occurred with seeps, leaks, or slope erosion on surface impoundments. What has been done to control, eliminate, or otherwise mitigate these issues? Were these seeps or leaks permitted under the NPDES program administered by the state? When were these permits issued? Are there any issues with discharge parameters that need treatment such as pH control? Please describe. **Outfall – 010 is internal, 003 is external. NPDES permitted. SOC number 5 came in mid-July/Aug. Limits are relaxed for this site. Per SOC, decanting Ash Basin next year. East basin flows to west basin, then outfall.**
7. Please describe the closure plan and its associated schedule that have been submitted to the state environmental agency for each landfill or impoundment. What factors drove the choice of closure plan options? Please describe the costs associated with the closure plan for the closure action chosen and any other alternative closure options that were considered. **Cap in place is**

Exhibit 2.3 – Site Visit Notes - Roxboro

the closure plan, waiting on final plan approval, CAMA low-risk. Cells 1-5 of the landfill are under interim cover, cell 6 is part of the EPA runoff control plan. Constructing a lined retention basin, waiting on state approval. 3 basins – using a bioreactor to treat water, it's a physical/chemical/biological system. Project underway to reroute leachate to the lined retention basin. There are two leachate tanks.

8. What issues to ground water drinking supplies have been caused by the seeps and leaks from the surface impoundments or landfills? What has been to address these issues?
9. Please describe the process where CCR is generated, conveyed, stored/disposed, or reused? Include the fraction of the CCR that is bottom ash, fly ash, economizer ash, and scrubber sludge and how much of each is stored/disposed or sold or beneficially reused. Where beneficiation exists or is contemplated for a site, please describe the following: (a) the process itself, (b) the rationale for choosing this technology, (c) the rationale for choosing this site, (d) the schedule of completing this project, and (e) the costs/performance associated with project. In the 1980s, the plant switched to dry fly ash. There are 5 silos, 2-3 are sold, others are disposed of if off spec or over quantity that's sellable. Currently commissioning a submerged flight conveyor system (dry bottom ash).

Exhibit 2.4 – Site Visit Notes – Cape Fear

Questions and Answers for Site Visit to Cape Fear Steam Station

12:20 to 2:57 pm

December 10, 2018

ATTENDEES:

Issa Zar Zar, Duke Energy CCP Lead East

Danny Wimberly, Duke Energy Beneficiation Projects Manager

Sharat Gollamudi, Duke Energy CCP System Owner, Cape Fear

Steve Cahoon, Duke Energy Environmental Compliance, Cape Fear

Dan Wittliff, GDS Associates, Inc.

1. How many and how big are the units are on the site, when were they commissioned, and when did they or will they cease operations? **The first coal unit at Cape Fear was commissioned in 1923 and the last coal units (5 and 6) were officially retired on October 1, 2012 demolition of the units began at that time. In addition, four small combustion turbines (CT's) were removed from service during this time. Demolition of the previous coal plants and combustion turbines along with auxiliary equipment is complete.**
2. How many CCR impoundments and landfills are on site, when were they built, and when were they decommissioned or closed? What is their capacity and how much is currently in place? **There are no landfills on the site and there are five ash basins on site. The ash basins were commissioned in 1956, 1963, 1970, 1978, and 1985. The 1985 Ash Basin has about 2.8 million tons of ash, 1956 Ash Basin has about 400 thousand tons of ash, the other three basins have about 800 thousand tons of ash each.**
3. Please describe how ash and sludge are conveyed to the impoundments or landfills. **Before the units were retired, bottom ash and fly ash were conveyed to the ash basins as a wet slurry. None of the units were equipped with a scrubber.**
4. Were landfills lined with a Subtitle D compliant liner when they were built? Please describe the liners currently in place on plant landfills where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **There are no landfills on the site.**
5. Were CCR surface impoundments (ponds) lined when they were built? Have they been lined since? Please describe the liners currently in place on plant surface impoundments where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **None of the ash basins are lined.**
6. Please describe any issues that have occurred with seeps, leaks, or slope erosion on surface impoundments. What has been done to control, eliminate, or otherwise mitigate these issues? Were these seeps or leaks permitted under the NPDES program administered by the state? When were these permits issued? Are there any issues with discharge parameters that need treatment such as pH control? Please describe. **According to project personnel, there were about 21 seeps prior to decanting operations. These areas of wetness (AOW) are marked with signs. Only Seep Number 5 is identified in the NPDES permit issued in November 2018. Seep 5**

Exhibit 2.4 – Site Visit Notes – Cape Fear

discharged through and monitored at Outfall 007. No treatment is required for Seep 5. The rest of the seeps (AOW) are to be included in the consent order (SOC) which is expected to be issued in the first quarter of 2019. Seep 15 is between the 1963 Pond and the river. Seep 16 is the main seep included in the consent order and passes the collected seep through a bed of limestone (in a cage) before discharging to the river. According to the System Owner, all of the dams are safe and stable. At the time of the inspection, both the 1978 and 1985 Ash Basins had standing water collected at the low end of each basin. According to Duke CCP personnel, this was rain water that fell in the ash basin after the initial decanting process was completed. The visual cues appeared to support that water level in both basins had been lowered through decanting and Duke CCP personnel indicated that the pond levels would be maintained at a level above the level where dewatering and ash removal would begin. The plan is to excavate the ash from the basins and put it through the beneficiation process (see Question 9) when the beneficiation plant is installed and commissioned during 2020. Out of spec ash will be landfilled off-site and qualifying ash will be sold to concrete plants.

7. Please describe the closure plan and its associated schedule that have been submitted to the state environmental agency for each landfill or impoundment. What factors drove the choice of closure plan options? Please describe the costs associated with the closure plan for the closure action chosen and any other alternative closure options that were considered. **Need to ask in writing for cost information. The closure plan includes the following steps: (a) Decant the free or bulk water down to the bottom three feet and maintain this level until dewatering begins; (b) Build the beneficiation plant (Evoqua -- CHECK) beginning in 2019 for 18 to 24 months; (c) Build Outfall 008; (d) Build ash haul roads and wheel wash facilities; (e) Excavate the ash, allow to dry, and screen the ash for size; (f) Build two piles of material (Active and Reserve); (g) Seal the Reserve Pile with EcoGreen; and (h) Truck ash from the screened and dry Active Pile to the beneficiation unit. Once the ash is completely excavated from the impoundments, the bottom will be confirmed for clean closure. Approximately 450 thousand tons of excavated ash per year (feedstock) will yield about 300 thousand tons of beneficiated ash per year.**
8. What issues to ground water drinking supplies have been caused by the seeps and leaks from the surface impoundments or landfills? What has been to address these issues? **Only two residences were within the half mile boundary. These were connected to a public water supply.**
9. Please describe the process where CCR is generated, conveyed, stored/disposed, or reused? Include the fraction of the CCR that is bottom ash, fly ash, economizer ash, and scrubber sludge and how much of each is stored/disposed or sold or beneficially reused. Where beneficiation exists or is contemplated for a site, please describe the following: (a) the process itself, (b) the rationale for choosing this technology, (c) the rationale for choosing this site, (d) the schedule of completing this project, and (e) the costs/performance associated with project. **There is no scrubber at the site. Approximately 20 percent of the CCR material is bottom ash and about 80 percent is fly ash. Note that the 1985 pond did receive low volume wastewater during the active life of the plant. See answer to Question 7 for a description of the beneficiation process. The startup fuel for the beneficiation plant is natural gas. The loss on ignition (LOI)**

Exhibit 2.4 – Site Visit Notes – Cape Fear

needed by the beneficiation process to sustain the process ranges from 6 to 12 percent. The finished product has a LOI that meets industry standards for use in concrete. SEFA is the marketer for the ash and the proprietor of the beneficiation technology.

Questions and Answers for Site Visit to HF Lee Steam Station

8:00 to 11:10 am

December 11, 2018

ATTENDEES:

Issa Zar Zar, Duke Energy CCP Lead East

Danny Wimberly, Duke Energy Beneficiation Projects Manager

Sharat Gollamudi, Duke Energy CCP System Owner, HF Lee

Richard Baker, Duke Energy Environmental Compliance

Matt Schellinger, SCORS

Zach Payne, SCORS

Dan Wittliff, GDS Associates, Inc.

1. How many and how big are the units are on the site, when were they commissioned, and when did they or will they cease operations? **The first coal unit at HF Lee was commissioned in 1951 and the last coal units (2 and 3) were officially retired on October 1, 2012. Demolition of the units was completed in 2017. Demolition of the previous coal plants along with auxiliary equipment is complete.**
2. How many CCR impoundments and landfills are on site, when were they built, and when were they decommissioned or closed? What is their capacity and how much is currently in place? **There are no landfills on the site and there are four ash basins on site. The ash basins were commissioned in 1951, 1955, 1962, and 1982. The 1982 Active Ash Basin has about 4.5 million tons of ash, 1951 Inactive Ash Basin has about 270 thousand tons of ash, the 1955 Inactive Ash Basin has about 530 thousand tons, and the 1962 Inactive Ash Basin has about 900 thousand tons of ash. The plan is to excavate the ash basins beginning with the 1982 Active Ash Basin to prepare the ash for processing in a beneficiation unit (see Question 9) scheduled to begin operations in August 2020. Beneficiation of the four ash ponds ash is required by CAMA to be completed in 2029. A request for an extension of time is expected to be submitted (see Question 9).**
3. Please describe how ash and sludge are conveyed to the impoundments or landfills. **Before the units were retired, bottom ash and fly ash were conveyed to the ash basins as a wet slurry. None of the units were equipped with a scrubber.**
4. Were landfills lined with a Subtitle D compliant liner when they were built? Please describe the liners currently in place on plant landfills where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **There are no landfills on the site.**
5. Were CCR surface impoundments (ponds) lined when they were built? Have they been lined since? Please describe the liners currently in place on plant surface impoundments where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **None of the ash basins are or were ever lined. While site personnel believed that the 1982**

Active Ash Basin failed the CCR Rules' criterion for separation between the bottom of the basin and the top of the aquifer, GDS was asked to submit this request in writing for a more precise response.

6. Please describe any issues that have occurred with seeps, leaks, or slope erosion on surface impoundments. What has been done to control, eliminate, or otherwise mitigate these issues? Were these seeps or leaks permitted under the NPDES program administered by the state? When were these permits issued? Are there any issues with discharge parameters that need treatment such as pH control? Please describe. **According to project personnel, there are constructed seeps which will be included in an NPDES permit which is expected to be issued later in December 2018. According environmental personnel, the NPDES permit was submitted timely in July 2014 and it is not unusual for a permittee to continue operations for extended period of time while the permit renewal is being processed. Any non-constructed seeps will be included in a consent order (SOC) which is expected to be issued during January 2019. For a precise answer on the number of seeps prior to decanting operations and afterwards, project personnel asked that GDS submit a formal request in writing. These areas of wetness (AOW) are marked with signs. Water level in the basins has been lowered through decanting which is now complete and Duke CCP personnel indicated that the pond levels would be maintained at a level above the level where dewatering and ash removal would begin. The plan is to excavate the ash from the basins and put it through the beneficiation process (see Question 9) when the beneficiation plant is installed and commissioned during 2020. Out of spec ash will be landfilled off-site and qualifying as will be sold to concrete plants.**
7. Please describe the closure plan and its associated schedule that have been submitted to the state environmental agency for each landfill or impoundment. What factors drove the choice of closure plan options? Please describe the costs associated with the closure plan for the closure action chosen and any other alternative closure options that were considered. **Need to ask in writing for cost information. The closure plan includes the following steps: (a) Decant the free or bulk water down to the bottom three feet and maintain this level until dewatering begins; (b) Build the beneficiation plant beginning in 2019 for 18 to 24 months; (c) Build water treatment plant to treat the remaining pond water while the ash is being removed; (d) Build ash haul roads and wheel wash facilities; (e) Excavate the ash, allow to dry, and screen the ash for size; (f) Build piles of material (Active and Reserve); (g) Seal the Reserve Pile with EcoGreen; and (h) Truck ash from the screened and dry Active Pile to the beneficiation unit. Once the ash is completely excavated from the impoundments, the bottom will be confirmed for clean closure. Approximately 450 thousand tons of excavated ash per year (feedstock) will yield about 300 thousand tons of beneficiated ash per year. It is possible that the beneficiation unit could produce more than this annually. Other options for closure were also considered for HF Lee. Site personnel asked that GDS submit a formal request in writing to ensure the knowledgeable personnel could respond.**
8. What issues to ground water drinking supplies have been caused by the seeps and leaks from the surface impoundments or landfills? What has been to address these issues? **Site personnel requested that GDS submit this request in writing to ensure a precise answer is provided.**

Exhibit 2.5 – Site Visit Notes – HF Lee

9. Please describe the process where CCR is generated, conveyed, stored/disposed, or reused? Include the fraction of the CCR that is bottom ash, fly ash, economizer ash, and scrubber sludge and how much of each is stored/disposed or sold or beneficially reused. Where beneficiation exists or is contemplated for a site, please describe the following: (a) the process itself, (b) the rationale for choosing this technology, (c) the rationale for choosing this site, (d) the schedule of completing this project, and (e) the costs/performance associated with project. **There is no scrubber or scrubber sludge at the site. Approximately 20 percent of the CCR material is bottom ash and about 80 percent is fly ash. Note that the 1982 pond did receive low volume wastewater during the active life of the plant. See answer to Question 7 for a description of the beneficiation process. The startup fuel for the beneficiation plant is natural gas. The loss on ignition (LOI) needed by the beneficiation process to sustain the process ranges from 6 to 12 percent. The finished product has a LOI that meets industry standards for use in concrete. SEFA is the marketer for the ash and the proprietor of the beneficiation technology.**
10. When asked by SCORS about the possibility of an extension of time to complete the beneficiation process should that be necessary, **site personnel responded that beneficiation at HF Lee is seen as a positive process and that any extension request (if necessary) is expected to be granted. Site personnel asked SCORS to submit this request in writing for a more precise answer.**

Questions and Answers for Site Visit to Sutton Steam Station

1:15 to 3:45 pm

December 11, 2018

ATTENDEES:

Issa Zar Zar, General Manager Duke Energy CCP East**Steve Gordy, Duke Energy Sutton Projects Manager****Tim Russell, Duke Energy CCP System Owner, Sutton****Steve Cahoon, Duke Energy Environmental Compliance****Don Gibbs, Duke Energy****Matt Schellinger, SCORS****Zach Payne, SCORS****Dan Wittliff, GDS Associates, Inc.**

1. How many and how big are the units are on the site, when were they commissioned, and when did they or will they cease operations? **The first coal unit at Sutton was commissioned in 1954 and the last coal unit was officially retired on November 2013. Demolition of the coal units was completed in 2017. Demolition of the previous coal plants along with auxiliary equipment is complete. Three combined cycle units remain on site.**
2. How many CCR impoundments and landfills are on site, when were they built, and when were they decommissioned or closed? What is their capacity and how much is currently in place? **There is one landfill on the site and there are two ash basins and one lay of land area (LOLA) on site. The ash basins were commissioned in 1971 and 1984 while LOLA was used from 1954 to 1972. The 1984 Ash Basin has about 2.8 million tons of ash. The 1971 Ash Basin has about 3.8 million tons of ash, the LOLA has about 685 thousand tons.**
3. Please describe how ash and sludge are conveyed to the impoundments or landfills. **Before the coal units were retired, bottom ash and fly ash were conveyed to the ash basins as a wet slurry. None of the units were equipped with a scrubber.**
4. Were landfills lined with a Subtitle D compliant liner when they were built? Please describe the liners currently in place on plant landfills where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **The only landfill on the site was permitted in September 2016, Cells 3 through 8 are built, and since July 2017 the landfill is receiving ash from the basins. The landfill is lined with a Subtitle D and CCR Rules compliant liner. While the permitted landfill could hold more, all that is needed is 5.3 million tons of capacity.**
5. Were CCR surface impoundments (ponds) lined when they were built? Have they been lined since? Please describe the liners currently in place on plant surface impoundments where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **Only the 1984 Ash Basin was lined with a clay liner that prevents communication between the**

contents of the basin and the groundwater 5 to 6 feet below. The 1971 Ash Basin is unlined with ash deposited as deep as 42 feet below sea level at the lowest point.

6. Please describe any issues that have occurred with seeps, leaks, or slope erosion on surface impoundments. What has been done to control, eliminate, or otherwise mitigate these issues? Were these seeps or leaks permitted under the NPDES program administered by the state? When were these permits issued? Are there any issues with discharge parameters that need treatment such as pH control? Please describe. **According to project personnel, there are no seeps constructed or non-constructed at the Sutton plant. The latest NPDES permit renewal was filed timely in 2014 which was issued October 2015 and later revised on September 29, 2017. Because there are no non-constructed seeps at Sutton, there will be no consent order (SOC) for Sutton. Water level in the basins has been lowered through decanting which is now complete and Duke CCP personnel indicated that the pond levels would be maintained at a level above the level where dewatering and ash removal would begin. All of the ash currently being excavated will be interred in a Subtitle D compliant lined landfill. Discharges of leachate, storm water, and extraction wells are processed through the wastewater treatment plant and controlled for pH and a list of other constituents.**
7. Please describe the closure plan and its associated schedule that have been submitted to the state environmental agency for each landfill or impoundment. What factors drove the choice of closure plan options? Please describe the costs associated with the closure plan for the closure action chosen and any other alternative closure options that were considered. **Need to ask in writing for cost information. The closure plan includes the following steps: (a) Decant the free or bulk water down to the bottom three feet and maintain this level until dewatering begins; (b) Build water treatment plant to treat the remaining pond water while the ash is being removed; (c) Excavate the ash by hydraulic or mechanical dredging and promote drying of the mass by turning the ash; and (d) Truck ash from the dry piles to the landfill for internment. Once the ash is completely excavated from the impoundments, the bottom will be confirmed for clean closure. Approximately 150 thousand tons of ash are being landfilled at the site per month (CHECK). Other options for closure were also considered for Sutton (see September 2014 closure options for Sutton). For a complete list, site personnel asked that GDS submit this request formally. However, the tight time constraints imposed by CAMA (i.e., complete by August 1, 2019) and the extended time to permit and build an on-site landfill as well as the costs associated with other options, it became necessary to haul the first 2.16 million tons of ash to Brickhaven Mine. Of this amount, the first 14 thousand tons were trucked to Brickhaven while the balance was shipped by rail. All of the rest of the ash will be landfilled on site. Current forecast is that, because of significant amounts rain and storms this year, completion will be complete by September 30, 2019. Duke has submitted a request for a six-month extension due to weather impacts. Landfill closure will occur when the LOLA ash is excavated and interred in the landfill.**
8. What issues to ground water drinking supplies have been caused by the seeps and leaks from the surface impoundments or landfills? What has been to address these issues? **Site personnel requested that GDS submit this request in writing to ensure a precise answer is provided.**

Exhibit 2.6 – Site Visit Notes - Sutton

9. Please describe the process where CCR is generated, conveyed, stored/disposed, or reused? Include the fraction of the CCR that is bottom ash, fly ash, economizer ash, and scrubber sludge and how much of each is stored/disposed or sold or beneficially reused. Where beneficiation exists or is contemplated for a site, please describe the following: (a) the process itself, (b) the rationale for choosing this technology, (c) the rationale for choosing this site, (d) the schedule of completing this project, and (e) the costs/performance associated with project. **There is no scrubber or scrubber sludge at the site. Approximately 20 percent of the CCR material is bottom ash and about 80 percent is fly ash. While beneficiation was considered for Sutton, the accelerated timeline and costs of the other options made the current closure excavate and landfill option the best for Sutton.**

Questions and Answers for Site Visit to Robinson Steam Station

1:15 to 3:45 pm

December 12, 2018

ATTENDEES:

Tim Hill, General Manager Duke Energy CCP West**Kevin Kirkley, Duke Energy Robinson CCP Projects Manager****Dan Zachary, Duke Energy CCP System Owner, Robinson****Scott Saunders, Duke Energy CCP Engineer, Robinson****Richard Baker, Director Duke Energy Environmental Compliance****Tina Woodward, Duke Energy Environmental Compliance NPDES****Bryson Sheetz, Duke Energy Environmental Compliance Ground Water****Tyler Hardin, Duke Energy Environmental Compliance Ground Water****Willie Morgan, SCORS****Dan Wittliff, GDS Associates, Inc.**

1. How many and how big are the units are on the site, when were they commissioned, and when did they or will they cease operations? **The only coal unit at Robinson was commissioned in 1960 and demolition was completed in 2016. Also on the site are nuclear power plant remains on site and the combustion turbines associated with the Darlington County peaking facility are adjacent to the Robinson plant site.**
2. How many CCR impoundments and landfills are on site, when were they built, and when were they decommissioned or closed? What is their capacity and how much is currently in place? **There is one ash basin and a lay of land area (LOLA) on site. The ash basin was commissioned in 1971 while LOLA in its current place was used from the time the nuclear plant was placed in LOLA's previous location until the time when the Ash Basin was built. The Ash Basin has about 2.6 million tons of ash. Within the Ash Basin are ash stacks. The LOLA has about 275 thousand tons.**
3. Please describe how ash and sludge are conveyed to the impoundments or landfills. **Before the Ash Basin was installed, bottom ash was slurried wet to the LOLA. After particulate controls were installed and up to the time the coal unit was retired, bottom ash and fly ash were conveyed to the ash basin as a wet slurry. The coal unit was not equipped with a scrubber.**
4. Were landfills lined with a Subtitle D compliant liner when they were built? Please describe the liners currently in place on plant landfills where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **While there was not a historical landfill on site. Duke personnel are in the early stages of building a Subtitle D and CCR Rules compliant landfill to hold ash excavated from LOLA and the Ash Basin. The landfill is scheduled to begin receiving ash from the basin and LOLA in December 2019. The landfill is lined with a Subtitle D**

Exhibit 2.7 – Site Visit Notes - Robinson

and CCR Rules compliant liner. The layers of the liner from bottom to top are 18 inches of 10^{-5} cm/sec clay soil, a geosynthetic clay liner, a 60 mil HDPE liner, a drainage net, and protective soil cover. The bottom of the new landfill will be at least five feet above ground water.

5. Were CCR surface impoundments (ponds) lined when they were built? Have they been lined since? Please describe the liners currently in place on plant surface impoundments where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner?
Neither LOLA nor the Ash Basin are lined with a clay liner. The ash in the Ash Basin sits in ground water while the ash in LOLA is above ground water. For actual elevations of the ash relative to ground water in the Basin, LOLA, or the new landfill, GDS was requested to submit a formal request for this information.
6. Please describe any issues that have occurred with seeps, leaks, or slope erosion on surface impoundments. What has been done to control, eliminate, or otherwise mitigate these issues? Were these seeps or leaks permitted under the NPDES program administered by the state? When were these permits issued? Are there any issues with discharge parameters that need treatment such as pH control? Please describe. **According to project personnel, there are four non-constructed seeps from the toe of the dam (which is about 35 feet tall). These seeps are collected in an under drain and conveyed to a five mile long discharge canal before entering Lake Robinson at External Outfall 001. Internal Outfall 005 collects the ash basin stormwater and seeps. The latest NPDES permit renewal was filed timely in 2010. Issues with cadmium in the discharge among other issues including a change in the permit writer have slowed progress in developing the draft permit which is expected in 2019. Duke personnel noted that, even with 12 inches of rain from Hurricane Florence, there was no storm water flow through.**
7. Please describe the closure plan and its associated schedule that have been submitted to the state environmental agency for each landfill or impoundment. What factors drove the choice of closure plan options? Please describe the costs associated with the closure plan for the closure action chosen and any other alternative closure options that were considered. **Need to ask in writing for cost information. Beginning with LOLA, the contractor will excavate the ash and install in the first of two 20-acre cells. Issues complicating the LOLA excavation and clean closure are the need to relocate four sets of 230 kv transmission line the poles of which are sitting in the LOLA ash. In addition, there is a forced sewer main owned by the City through the LOLA that has to be rerouted. Once the ash is completely excavated from these impoundments, the bottoms will be confirmed for clean closure. Other options for closure were also considered for Robinson (see September 2014 closure options for Robinson). For a complete list, site personnel asked that GDS submit this request formally.**
8. What issues to ground water drinking supplies have been caused by the seeps and leaks from the surface impoundments or landfills? What has been to address these issues? **Site personnel requested that GDS submit this request in writing to ensure a precise answer is provided.**
9. Please describe the process where CCR is generated, conveyed, stored/disposed, or reused? Include the fraction of the CCR that is bottom ash, fly ash, economizer ash, and scrubber sludge and how much of each is stored/disposed or sold or beneficially reused. Where beneficiation exists or is contemplated for a site, please describe the following: (a) the process itself, (b) the

Exhibit 2.7 – Site Visit Notes - Robinson

rationale for choosing this technology, (c) the rationale for choosing this site, (d) the schedule of completing this project, and (e) the costs/performance associated with project. **There is no beneficiation planned for Robinson.**

Exhibit 2.8 – Site Visit Notes - Weatherspoon

Questions and Answers for Site Visit to Weatherspoon Steam Station

7:42 to 10:45 am

December 12, 2018

ATTENDEES:

Issa Zar Zar, GM Duke Energy CCP East

Danny Wimberly, Duke Energy Beneficiation Projects Manager

Tim Russell, Duke Energy CCP System Owner, Weatherspoon

Ann Pifer, Duke Energy Environmental Compliance

Willie Morgan, SCORS

Dan Wittliff, GDS Associates, Inc.

1. How many and how big are the units are on the site, when were they commissioned, and when did they or will they cease operations? **The first coal unit at Weatherspoon was commissioned in 1949 and the last two coal units (2 and 3) came online in the 1950's. The last coal unit was decommissioned on October 1, 2012. Demolition of the units has been completed. Demolition of the previous coal plants along with auxiliary equipment is complete. Four simple cycle combustion turbines rated at 35 MW each remain on the site for peaking capability and black start capability.**
2. How many CCR impoundments and landfills are on site, when were they built, and when were they decommissioned or closed? What is their capacity and how much is currently in place? **There are no landfills on the site and there is one ash basin with three cells and a polishing pond on site. The ash basin evolved over time to become the final footprint today in 1979 when the external dikes were installed around the ash basin. The Ash Basin had about 2.45 million tons of ash before the plant removed 280 thousand tons of ash between September 2017 and September 2018. Duke is contracted with two cement kilns Argos and Olsen about 150 miles south in South Carolina to supply between 230 and 280 thousand tons of graded (< 1 inch) and dried ash (about 25 percent water) per year total. Beneficiation of the ash basin ash is required by CAMA to be completed in 2029. Duke personnel indicated that the Weatherspoon ash beneficiation could be finished in six to eight years (see Question 9).**
3. Please describe how ash and sludge are conveyed to the impoundments or landfills. **Before the units were retired, bottom ash and fly ash were conveyed to the ash basins as a wet slurry. None of the units were equipped with a scrubber.**
4. Were landfills lined with a Subtitle D compliant liner when they were built? Please describe the liners currently in place on plant landfills where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner? **There are no landfills on the site.**
5. Were CCR surface impoundments (ponds) lined when they were built? Have they been lined since? Please describe the liners currently in place on plant surface impoundments where CCR is stored or disposed of? How far above the uppermost aquifer is the bottom of the liner?

Exhibit 2.8 – Site Visit Notes - Weatherspoon

None of the ash basins are or were ever lined. GDS was asked to submit this request in writing for a more precise response on the separation between the bottom of the ash basin and the top of the aquifer.

6. Please describe any issues that have occurred with seeps, leaks, or slope erosion on surface impoundments. What has been done to control, eliminate, or otherwise mitigate these issues? Were these seeps or leaks permitted under the NPDES program administered by the state? When were these permits issued? Are there any issues with discharge parameters that need treatment such as pH control? Please describe. **According to project personnel, there are constructed seeps which will be included in an NPDES permit which was effective on November 1, 2018. The constructed seeps flow to the cooling water pond which then flows to the External Outfall 001 which flows intermittently depending on storm events. Duke personnel are required to sample 001 upstream and downstream when these episodes occur. In addition the plant has an internal outfall 001A which is sampled weekly for wastewater from the polishing pond for oil/grease, pH, and TSS. Internal outfall 115A is representative of the toe drains for O/G and TSS with a quarterly grab sample for a suite of constituents. Any non-constructed seeps will be included in an consent order (SOC) which is in progress. For a precise answer on the number of seeps prior to decanting operations and afterwards, project personnel asked that GDS submit a formal request in writing. These areas of wetness (AOW) are marked with signs. Water level in the basins has been lowered through decanting which is now complete and Duke CCP personnel indicated that the pond levels would be maintained at a level above the level where dewatering and ash removal would begin. The plan is to excavate the ash from the basins and put it through the beneficiation process (see Question 9) when the beneficiation plant is installed and commissioned during 2020. Out of spec ash will be landfilled off-site.**
7. Please describe the closure plan and its associated schedule that have been submitted to the state environmental agency for each landfill or impoundment. What factors drove the choice of closure plan options? Please describe the costs associated with the closure plan for the closure action chosen and any other alternative closure options that were considered. **Need to ask in writing for cost information. The closure plan includes the following steps: (a) Decant the free or bulk water down to the bottom three feet and maintain this level until dewatering begins; (b) Excavate the ash, allow to dry, and screen the ash for size; (c) Build piles of material (Active and Reserve); (d) Seal the Reserve Pile with EcoGreen; and (h) Truck ash from the screened and dry Active Pile to the cement kilns in South Carolina. Once the ash is completely excavated from the impoundments, the bottom will be confirmed for clean closure. Duke is contracted to send between 230 and 280 thousand tons of prepared ash trucked to the kilns per year. It is possible that the process could produce more than this annually. Other options for closure were also considered for Weatherspoon. Site personnel asked that GDS submit a formal request in writing to ensure the knowledgeable personnel could respond.**
8. What issues to ground water drinking supplies have been caused by the seeps and leaks from the surface impoundments or landfills? What has been to address these issues? **Site personnel requested that GDS submit this request in writing to ensure a precise answer is provided.**

Exhibit 2.8 – Site Visit Notes - Weatherspoon

9. Please describe the process where CCR is generated, conveyed, stored/disposed, or reused? Include the fraction of the CCR that is bottom ash, fly ash, economizer ash, and scrubber sludge and how much of each is stored/disposed or sold or beneficially reused. Where beneficiation exists or is contemplated for a site, please describe the following: (a) the process itself, (b) the rationale for choosing this technology, (c) the rationale for choosing this site, (d) the schedule of completing this project, and (e) the costs/performance associated with project. **There is no scrubber or scrubber sludge at the site. See answer to Question 7 for a description of the how the ash is excavated, dried, and sized for use in the cement kilns. For a cost comparison of the Sutton versus Weatherspoon operation, GDS was requested to submit this formally in writing.**

**BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA**

DOCKET NO. 2018-319-E

IN THE MATTER OF:

Application of Duke Energy Carolinas, LLC)	DIRECT TESTIMONY OF
For Adjustments in Electric Rate Schedules)	JON F. KERIN
and Tariffs)	FOR DUKE ENERGY
)	CAROLINAS, LLC

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT POSITION.

A. My name is Jon F. Kerin. My business address is 411 Fayetteville Street, Raleigh, North Carolina, 27601-1849. I am employed by Duke Energy Business Services, LLC, as Vice President, Coal Combustion Products (“CCP”) Operations, Maintenance and Governance. In this docket, I am testifying on behalf of Duke Energy Carolinas, LLC (“DE Carolinas” or the “Company”). As more fully discussed below, my responsibilities have included providing governance and operations leadership to Duke Energy Corporation’s (“Duke Energy”) regulated operating companies, including DE Carolinas. Relevant to this testimony, during 2014, I held the position of General Manager in the Ash Basin Strategic Action Team – referred to as “ABSAT.” I was named to my current role in 2015. In July 2018, I assumed additional responsibilities in the CCP organization, taking on responsibility for the Operations and Maintenance division.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I have a Bachelor of Science degree from the University of Maryland. I have over 30 years of experience in the electric utility industry, where I have been involved in various complex and challenging projects. In addition to my CCP experience, my background includes experience at various nuclear electric generating power plants and in other corporate functions. Prior to the merger of Progress Energy, Inc. and Duke Energy, I was the Director of the Project Management Center of

1 Excellence for Progress Energy, Inc. After the merger, I became General
2 Manager, Performance Improvement in the Project Management and Construction
3 Department before transitioning to the ABSAT team. In these roles, I worked
4 with new project implementation and construction teams to ensure that major
5 compliance projects and major construction projects were planned, executed, and
6 completed in a reasonable, prudent, and cost-effective manner as required by
7 regulatory bodies in Duke Energy's regulated jurisdictions. In these roles, I
8 worked on and provided advice and leadership to over a dozen major projects
9 with combined costs exceeding \$5 billion. I also led efforts to develop and
10 establish enterprise-wide procedures to ensure all regulated projects were
11 completed in a prudent and cost-effective manner.

12 **Q. WHAT WAS THE PURPOSE OF THE ASH BASIN STRATEGIC ACTION**
13 **TEAM?**

14 A. The ABSAT team was the umbrella organization created for Duke Energy
15 companies to address the laws, regulations, and orders concerning the
16 management of coal combustion residuals ("CCR").¹ These new compliance
17 requirements apply to electric generating sites with new and existing CCR
18 landfills and surface impoundments (collectively "CCR units"), and impose new
19 obligations regarding landfill design, structural integrity design and assessment
20 criteria for CCR basins, groundwater monitoring and protection procedures,
21 closure of impoundments, and operational and reporting procedures for the

¹ CCR refers to fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities. 40 C.F.R. § 257.53.

1 disposal and management of CCR. This work has now been absorbed into the
2 CCP organization.

3 During my work on the ABSAT team, I spent approximately 3,000 hours
4 working exclusively on CCR issues. During this time, I reviewed and became
5 familiar with relevant state and federal regulations dealing with CCR issues as
6 detailed further in my testimony and as set out in Kerin Exhibit 1. I also studied
7 and became knowledgeable on historical industry practices and standards to
8 comply with these regulations. As part of this process, I interviewed legacy
9 employees in Fossil Hydro Operations, Environmental Health and Safety, and
10 Central Engineering who worked at, and with, coal combustion generating units
11 and CCR handling sites. I reviewed historical company documents dealing with
12 these facilities and sites to gain an understanding of how CCR handling standards
13 inside and outside of the Company have developed over time. I also interviewed
14 legacy employees at other Southeast utilities including Dominion Energy, AEP,
15 TVA, and Southern Company.

16 As part of my duties on the ABSAT team, I toured and inspected every
17 CCR basin in Duke Energy's North and South Carolina jurisdictions. I also
18 toured and examined other CCR units at Duke Energy's Midwest sites, and
19 Dominion Energy, AEP, TVA, and Southern Company sites. During my tenure on
20 the ABSAT team, I developed CCR evaluations for each of Duke Energy's CCR
21 sites and, where applicable, worked on developing comprehensive work plans
22 when work was needed on any of those sites. In the course of my duties, I also
23 interfaced with other utilities to discuss and enhance mutual understandings on

1 evolving industry standards relating to CCR issues, and shared and received best
2 practices across the electric industry. I developed an industry peer group to
3 discuss CCR issues, which meets semi-annually and includes companies such as
4 Dominion and Southern Company. In this capacity, I also gained an
5 understanding and knowledge of coal ash management practices at utilities across
6 the country.

7 **Q. WHAT ARE YOUR PRIMARY RESPONSIBILITIES AS THE VICE**
8 **PRESIDENT, OPERATIONS, MAINTENANCE, AND GOVERNANCE?**

9 A. I am responsible for regulatory affairs, operations support, and other centralized
10 CCR functions. My team works to define, establish, and maintain fleet CCP
11 standards, programs, processes, and best practices within functional areas for all
12 fossil plant sites. My team also oversees site operations and maintenance
13 (“O&M”) of CCP facilities, including CCR and high-hazard dam operations and
14 maintenance, production landfills, decommissioning and demolition, and
15 byproducts management.

16 In my current role, virtually 100 percent of my time is dedicated to CCR
17 oversight, compliance, operations, maintenance, and project execution activities.
18 I have continued to review and study evolving rules and regulations related to
19 CCR issues. I have also maintained my presence in industry peer groups
20 regarding CCR issues and continue to help monitor, develop, and implement
21 industry best practices and standards for CCR issues.

1 **Q. HAVE YOU EVER TESTIFIED BEFORE A REGULATORY BODY?**

2 A. Yes. I filed direct testimony regarding CCR issues in Duke Energy Progress,
3 LLC's ("DE Progress") rate case in South Carolina in Docket 2016-227-E and
4 appeared before the Public Service Commission of South Carolina in October
5 2016 in connection with that case. I also filed direct and rebuttal testimony
6 regarding CCR issues in DE Progress' and DE Carolinas' recent North Carolina
7 rate cases in Docket Nos. E-2, Sub 1142 and E-7, Sub 1146, respectively, and
8 testified before the North Carolina Utilities Commission in connection with those
9 cases.

10 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

11 A. DE Carolinas is seeking recovery of CCR expenses incurred from January 2015
12 through August 2018 and estimated costs to be incurred September 2018 through
13 December 2018 related to compliance with applicable regulatory requirements.
14 The purpose of my testimony is to explain those regulatory requirements and to
15 explain how our compliance actions and decisions, including our current plans to
16 meet existing legal requirements, have been and continue to be reasonable,
17 prudent, and cost-effective approaches to comply with those regulatory
18 requirements.

19 **Q. PLEASE BRIEFLY SUMMARIZE YOUR TESTIMONY.**

20 A. DE Carolinas has become subject to both federal and state regulatory
21 requirements that mandate closure of its ash basins and other ash storage areas.
22 Since the early 1900s, DE Carolinas has disposed of CCR in compliance with
23 then-current regulatory requirements and industry practices. Until the 1950s,

1 CCR were either emitted through, in the case of fly ash, smokestacks or, in the
2 case of bottom ash, manually removed from boilers and stored in fill areas. Since
3 that time, the industry transitioned to wet sluicing using water to remove ash from
4 boilers, and to clean the electrostatic precipitators (“ESP”), preventing ash from
5 being emitted through the smokestacks. This effluent, as well as flue gas
6 desulfurization (“FGD”) blowdown, was then diverted to ash basins, or
7 impoundments. DE Carolinas has 17 ash basins in the Carolinas.

8 In the mid-1970s, the enactment of the Clean Air Act (42 United States
9 Code §7401 et seq.) and its subsequent amendment in the 1990s required electric
10 utilities to capture more CCR through the use of ESP or bag houses and FGD
11 blowdown. The Clean Water Act of 1972 (33 United States Code §1251 et seq.),
12 and the subsequent creation of the National Pollutant Discharge Elimination
13 System (“NPDES”) permitting system, made wet ash handling and ash basins the
14 primary lawful and effective way to meet CCR needs and environmental
15 regulatory requirements from 1974 until 2015.

16 In June 2010, the United States Environmental Protection Agency (“EPA”)
17 proposed national minimum criteria to regulate the disposal of CCR and the
18 operation and closure of active CCR landfills and existing and inactive CCR
19 surface impoundments. Approximately five years later, EPA published the final
20 CCR Rule in the Federal Register in April 2015.

21 In South Carolina, DE Carolinas entered into a Consent Agreement with
22 the South Carolina Department of Health and Environmental Control
23 (“SCDHEC”) in September 2014. Pursuant to this agreement, DE Carolinas

1 agreed to excavate its ash basins and ash storage areas at the W.S. Lee Steam
2 Station in Anderson County, South Carolina. It should be noted that other South
3 Carolina utilities are closing their ash basins in a similar fashion and also pursuant
4 to Consent Agreements with and approval from SCDHEC.

5 Also, in 2014, the state of North Carolina enacted the Coal Ash
6 Management Act of 2014 (“CAMA”), which requires that all ash basins in North
7 Carolina be closed, either through excavation or via the cap-in-place method. In
8 many respects, CAMA mirrors the federal CCR Rule.

9 All of DE Carolinas’ ash basins must be closed under the CCR Rule,
10 South Carolina regulatory oversight, and/or CAMA. The Company has begun the
11 process of closing, or submitting plans to close, its ash basins in accordance with
12 the program with the most restrictive requirements. There is a great deal of
13 duplication and interaction between the CCR Rule and state regulatory
14 requirements. As I explain below in my testimony, many of the actions Duke
15 Energy will take will serve multiple compliance purposes. In fact, many actions
16 and draft rules applicable to many utilities, not just Duke Energy, were already
17 being developed prior to 2014, and we are now in another wave of evolution in
18 environmental regulation pertaining to ash. *See* Kerin Exhibit 2. In response to
19 these new requirements addressing CCR disposal activities, the Company is
20 adding dry fly ash, bottom ash, and FGD blowdown handling systems to
21 operating coal-fired plants that are not already so equipped. The Company is also
22 modifying all active and decommissioned plants to divert storm water and low-
23 volume wastewater away from the basins.

1 Accordingly, the Company is requesting recovery of the incremental
2 compliance costs related to coal ash pond closures incurred starting January 2015
3 through August 2018 and expected compliance costs from September 2018
4 through December 2018 as explained in more detail by Company Witness Smith.
5 My testimony and exhibits demonstrate that both these incurred and expected
6 compliance costs are reasonable, prudent, and cost-effective given the individual
7 facts and circumstances at each power plant and ash basin site at issue.²

8 **Q. HOW IS YOUR TESTIMONY ORGANIZED?**

9 A. In this Section I, I have provided information concerning my background and the
10 purpose of my testimony. In Section II, I provide an overview of the generation
11 resources, including coal-fired generation, that the Company has used to reliably
12 and efficiently serve customers for over 100 years of its existence. I explain that
13 CCR are the natural byproduct of burning coal to generate electricity. I discuss
14 the Company's past practices for the storage and disposal of CCR, and I explain
15 that its practices have been in accordance with the electric power industry's
16 prudent standards and applicable laws, regulations, and permit requirements as
17 they have existed over time. In Section III, I discuss the new requirements
18 imposed on the Company under the new CCR compliance requirements. In
19 Section IV, I discuss the Company's plans to comply with the CCR compliance
20 requirements, the required regulatory approvals and permits for DE Carolinas'
21 compliance plans, including timing and implementation issues, and costs incurred
22 to date and expected over the next several years. I also explain and demonstrate

² This case excludes any fines or penalties incurred by DE Carolinas related to ash basin closure or management.

1 how each of the Company's historical and ongoing CCR compliance costs are
2 reasonable, prudent, and cost-effective given the individual facts and
3 circumstances at each power plant and ash basin site at issue.

4 **Q. ARE YOU PROVIDING ANY EXHIBITS WITH YOUR TESTIMONY?**

5 A. Yes, I have attached 10 total exhibits, described below, as well as an appendix:

6 Kerin Exhibit 1: Statutes and Regulations (listing of relevant coal ash
7 environmental regulations);

8 Kerin Exhibit 2: CCR Rule (text of the Federal CCR Rule);

9 Kerin Exhibit 3: Site Locations NC and SC (map of coal ash facilities);

10 Kerin Exhibit 4: Site Facts (site-specific background information);

11 Kerin Exhibit 5: Ash Basin Information (site-specific information about ash units)

12 Kerin Exhibit 6: Responses to Rule Changes Through the Decades DEC
13 (summary of DE Carolinas' compliance with evolving environmental
14 regulations);

15 Kerin Exhibit 7: Beneficiation Year 2015 thru August 2018 (summary of
16 beneficiation at DE Carolinas Sites);

17 Kerin Exhibit 8: Graphics Cap-in-Place and Landfill (graphical depiction of cap-
18 in-place and landfill closure methodologies);

19 Kerin Exhibit 9: Closure Plans (site-specific closure plans and engineering
20 reports); and

21 Kerin Exhibit 10: Components of 2015-2018 Recovery Request (summary of
22 costs and regulatory drivers relevant to DE Carolinas' application).

1 **II. DE CAROLINAS' GENERATION RESOURCES**

2 **Q. PLEASE PROVIDE AN OVERVIEW OF THE COMPANY'S ELECTRIC**
3 **GENERATION ASSETS.**

4 A. DE Carolinas has provided reliable electric generation for decades to its
5 wholesale and retail customers in South Carolina and North Carolina from a
6 diverse portfolio of generating assets including those that generate electricity
7 using coal, nuclear fuels, natural gas, hydro flows, and solar photovoltaic energy
8 sources. Until recently, coal has been the historic "go-to" fuel choice for base-
9 load, least-cost reliable service. Accordingly, in South Carolina and North
10 Carolina, DE Carolinas has operated eight coal-fired generating facilities with
11 CCR units that contain historically produced CCR directly resulting from the coal
12 combustion process. These eight coal-fired DE Carolinas generating facilities
13 have 17 CCR basins that date back to the 1950s and were an integral part of
14 historical coal-fired power generation at these sites.

15 **Q. WHAT IS THE CURRENT STATUS OF THE COMPANY'S COAL-FIRED**
16 **GENERATING FACILITIES?**

17 A. Of the eight coal-fired DE Carolinas generating facilities with ash basins, coal-
18 powered electric generation has ceased at four of these stations, including the Dan
19 River, Buck, Riverbend, and W.S. Lee plants. Refer to Kerin Exhibit 3 for the
20 geographical location of the eight coal-fired generating facilities with ash basins
21 in the DE Carolinas service territory.

1 **Q. WHAT ARE COAL COMBUSTION RESIDUALS?**

2 A. CCR are byproducts produced from the burning of coal in coal-fired power
3 generation plants and include fly ash, bottom ash, boiler slag, and FGD material.
4 Fly ash and bottom ash are direct byproducts of the coal combustion process. Fly
5 ash is a very fine, powdery material composed mostly of silica produced from the
6 burning of finely ground coal in the boiler. Bottom ash is a coarse, angular ash
7 particle that is too large to be carried up into the smoke stacks, so it forms in the
8 bottom of the coal furnace. Bottom ash makes up approximately 15 percent of the
9 total ash produced. In the early years of operation, bottom ash was manually
10 collected at the bottom of the boiler, and then transported to an ash storage
11 location. Later, the industry utilized a water sluice process to efficiently transport
12 the bottom ash to ash storage basins. In the early years, fly ash went directly out
13 the smoke stack. The industry later employed collection of the fly ash using
14 electrostatic precipitators and bag houses in order to improve air emissions, where
15 the ash was then efficiently water sluiced to an ash basin. As I explain above, DE
16 Carolinas' coal-fired generation facilities either have been or are being modified
17 to incorporate dry fly ash and/or dry bottom ash handling. Additional CCR flow
18 in the form of wastewater is produced by the operation of FGD systems at specific
19 operating coal-fired sites. All of the types of CCR mentioned above are
20 byproducts of the electricity production process lifecycle at coal-fired generation
21 plants.

1 **Q. PLEASE PROVIDE A HISTORY OF DE CAROLINAS' ELECTRIC**
2 **GENERATION RELYING ON COAL AS THE FUEL SOURCE.**

3 A. The Company's electric power generation from burning coal dates back to the
4 Greenville Steam Station, Duke Power's first coal-fired fossil plant, which was
5 completed and placed in service in Greenville, South Carolina, to supply standby
6 and peak-load electricity on April 1, 1911. Kerin Exhibit 4 provides details
7 regarding the commercial operation date, generation capacity (megawatts or
8 MW), and retirement date, if applicable, for the eight DE Carolinas coal-fired
9 generating stations with ash basins in the Carolinas.

10 All of these coal plants produced CCR, fly ash, and bottom ash, as direct
11 byproducts of the coal combustion process. In the 1950s the electric utility
12 industry began to efficiently transport bottom ash by water sluicing to constructed
13 surface impoundments, which we commonly refer to as ash basins. Some of DE
14 Carolinas' older ash basins include the 1956 primary ash basin at the Dan River
15 Plant and the 1957 ash basins at the Allen, Buck, Riverbend and Cliffside plants.
16 Kerin Exhibit 5 provides details regarding when DE Carolinas' ash basins were
17 constructed, their estimated content of ash in tons, and when they were taken out
18 of service, if applicable. The CCR contained in these basins represent the
19 byproduct of decades of reliable coal-fired generation at these sites and a process
20 step in the electricity generation life cycle.

1 **Q. HOW HAVE ENVIRONMENTAL COMPLIANCE OBLIGATIONS**
2 **RELATED TO CCR MANAGEMENT EVOLVED OVER TIME?**

3 A. Environmental regulations related to CCR management have evolved
4 significantly over time, affecting how the Company has operated its coal-fired
5 stations in compliance with new and evolving environmental obligations. At each
6 step in the environmental regulatory evolution process, DE Carolinas was in line
7 with industry standards and reasonably and prudently managed CCRs and its coal
8 ash basins.

9 Before the Clean Air Act was amended in 1970, the only type of CCRs
10 collected at the Company's plants was bottom ash. Bottom ash was sometimes
11 stored in basins and sometimes placed dry on the land surface in "lay of land"
12 areas, which was lawful at the time. After new Clean Air Act requirements were
13 put in place, the utility industry, including DE Carolinas, added electrostatic
14 precipitators to coal-fired plants in the 1970s to reduce air emissions of fly ash.
15 The collection of fly ash significantly increased the volume of CCR being handled
16 at the plants, giving rise to the need for larger basins and ash handling systems.
17 Additionally, since the 1990 Clean Air Act amendments, a greater emphasis on
18 sulfur emissions control has prompted many coal burning power plants to install
19 FGD units (also known as "scrubbers"). FGD scrubbers generate byproducts,
20 primarily gypsum, which are classified as a type of CCR.

21 In 1972, the Federal Water Pollution Control Act, now known as the Clean
22 Water Act ("CWA"), was amended to provide a new comprehensive program for
23 regulating discharge of pollutants into the waters of the United States and

1 regulating quality standards for surface waters. The CWA resulted in the
2 establishment of a systematic permit system to monitor water quality and to
3 provide specific limits for the flow and content of process water leaving these ash
4 basins. Many of the Company's ash basins (at least one at each power plant) were
5 operating before the passage of the CWA amendments in 1972, which created the
6 NPDES permitting program. These plants subsequently received NPDES permits
7 from South Carolina and North Carolina after the states received authority from
8 the EPA to issue permits.

9 In accordance with the CWA, the EPA promulgated Effluent Limitations
10 Guidelines ("ELGs") for the Steam Electric Power Generating industry category
11 in 1974. The Development Document for the 1974 rule states that most coal-fired
12 plants across the industry used wet ash handling and ash basins for treatment of
13 ash handling wastewater, although some plants employed other methods for site-
14 specific reasons, such as space constraints. In the 1974 rule, the EPA set limits
15 based on Best Practicable Control Technology Currently Available ("BPT") and
16 Best Available Technology Economically Achievable ("BAT") for fly ash
17 transport water and bottom ash transport water. In both cases, the limits were
18 based on the use of wet ash handling and treatment in ash basins. In 1982, the
19 EPA withdrew the BAT limitations on fly ash transport water and left the limits on
20 bottom ash transport water unchanged.³ The ELGs for the Steam Electric Power
21 Generating category were not amended again until 2015. As a result, from 1974
22 to 2015, ash basins were a lawful and effective way of meeting the wastewater

³ The rule did prohibit the discharge of fly ash transport water at new facilities.

1 treatment requirements under the CWA. In 2015, the EPA finalized new ELGs
2 that adopted a zero discharge requirement for both fly ash and bottom ash
3 transport water at existing facilities. Meeting these limits effectively requires
4 converting to dry ash handling or ceasing plant operations.

5 Before 2015, CCRs were not regulated under the Resource Conservation
6 and Recovery Act ("RCRA"). CCRs are classified under RCRA as a "special
7 waste." Under RCRA § 3001(b)(3)(A) (known as the Bevill Amendment), fossil
8 fuel combustion waste and several other waste categories were initially exempt
9 from regulation as hazardous waste under RCRA Subtitle C. The EPA was
10 required to assess fossil fuel combustion waste and the other types of exempted
11 waste and submit a formal report to Congress on its findings. The EPA was then
12 required to make a final regulatory determination as to whether the special waste
13 should be regulated as a hazardous waste. The EPA published rules in 1993 and
14 2000 concluding that CCR should not be regulated as hazardous waste. On
15 December 22, 2008, a large coal ash spill occurred at the TVA power plant in
16 Kingston, Tennessee. While this event prompted the industry to take note of the
17 causes for the TVA spill from an operational perspective, the event also prompted
18 the EPA to revisit its determination regarding CCR. On June 21, 2010, the EPA
19 proposed regulations under RCRA to address the risks from the disposal of CCR
20 generated from the combustion of coal at electric utilities and independent power
21 producers. This proposal contained three regulatory options. Under the first, the
22 EPA proposed to list CCR as special wastes subject to regulation under Subtitle C
23 (hazardous waste) of RCRA when they are destined for disposal in landfills or

1 surface impoundments. Under the other two options, the EPA proposed to
2 regulate disposal of such materials under Subtitle D (non-hazardous waste) of
3 RCRA by issuing national minimum criteria. Because the proposals were very
4 different, it was difficult for the utility industry, including the Company, to predict
5 the timing and methods that would be required under the new rule for closing ash
6 basins. The rule was not finalized until 2015, when the EPA announced its
7 selection of the Sub-Title D option, regulating CCR as non-hazardous waste.
8 Additional details about the CCR Rule are set out below.

9 Before the CCR Rule, CCR management was regulated under state laws
10 by statutes and regulations dealing with water quality protection and solid waste
11 management. Ash basins were regulated through dam safety regulations and
12 NPDES permits. Use of ash removed from ash basins was regulated by rules for
13 distribution of residual wastewater solids, which required a permit for the use of
14 removed ash. Construction and operation of landfills were governed by solid
15 waste rules, and beneficial use of dry ash for structural fill was regulated by
16 provisions of the solid waste rules.

17 As noted above, in September 2014 the Company entered into the W.S.
18 Lee Consent Agreement (“Consent Agreement”) with SCDHEC, which addressed
19 future ash management at the W.S. Lee Plant. The Consent Agreement requires
20 DE Carolinas to excavate ash from the Inactive Ash Basin, the Ash Fill Area, and
21 any other areas where ash may have potentially migrated from these sites and
22 dispose of the ash in an onsite landfill. Excavation of the Inactive Ash Basin and

1 Ash Fill Area is in addition to the Company's decision pursuant to the CCR Rule
2 to excavate ash from the W.S. Lee Plant's Primary and Secondary Ash Basins.

3 In 2014, the North Carolina General Assembly passed CAMA, which,
4 among other things, requires the closure of ash basins in North Carolina according
5 to a defined schedule and methodology.

6 Compliance with each phase of new environmental regulatory
7 requirements that I have discussed required DE Carolinas to modify its operations
8 and incur additional expenditures. Kerin Exhibit 6 graphically depicts how these
9 regulations and requirements changed over time and how DE Carolinas
10 reasonably and prudently responded to each of those changes.

11 **Q. HOW DID THESE EVOLUTIONS IN ENVIRONMENTAL OBLIGATIONS**
12 **IMPACT CCR PRODUCTION AND STORAGE AT THE COMPANY'S**
13 **COAL-FIRED GENERATION FACILITIES?**

14 A. Both the volume and characteristics of CCR managed at the Company's facilities
15 have changed in response to changes in air emissions control requirements,
16 beginning with the use of electrostatic precipitators to capture fly ash. As the
17 coal-fired generating plants addressed evolving air emissions requirements,
18 modifications such as the addition of selective catalytic reduction equipment to
19 control emissions of nitrogen oxides and FGD systems to control sulfur dioxide
20 were made to many of DE Carolinas' coal-fired generating plants. The addition
21 of FGD systems affected the existing ash basins by directing FGD blowdown
22 flow to the CCR basins, which represented a new additional CCR flow. At certain
23 sites, such as at the Marshall Plant, newly-constructed engineered wetlands were

1 built within the footprints of the CCR basins to process the FGD blowdown flow.
2 At Allen and Belews Creek, bio-reactor systems were installed to process the new
3 CCR flows. Further, as a result of new FGD systems being added, limestone pile
4 run-off flows and gypsum pile run-off flows were typically also directed to the
5 existing ash basins.

6 Consistent with the rest of the industry, as recognized by the EPA in its
7 ELGs, the Company has relied primarily on ash basins to treat these waste
8 streams, at least as a final step. The ash basins have been effective at treating
9 wastewater to meet NPDES permit limits. In the absence of any regulatory
10 directive to do so, the Company reasonably did not pursue and should not have
11 pursued regulatory closure or retrofitting for any site that was still generating ash
12 and that maintained its NPDES permit. However, the South Carolina Consent
13 Agreements in 2014 established a new set of procedures for closure plans for
14 plants in South Carolina. In compliance with the CCR Rule and state regulatory
15 requirements, the Company has now prepared closure plans or site analysis and
16 removal plans, as applicable, for all of its ash basins.

17 Historically, the Company has invested in conversion to dry ash handling
18 at certain plants when it was called for by site-specific conditions. Following the
19 promulgation of the CCR Rule and passage of CAMA, however, the Company is
20 converting to full dry ash handling at all operating plants as required by those
21 requirements and as the only viable alternative to plant closure. This involves
22 both installing new equipment and securing disposal capacity. The ash basins are
23 a part of the coal-fired generation process at the sites and provide dilution,

1 settling, and/or retention functions for other power plant process water flows,
2 such as low volume wastewater, coal pile run-off, landfill leachate, and FGD
3 wastewater. Additionally, all plant discharges will be rerouted away from ash
4 basins at retired and active sites.

5 DE Carolinas has also historically pursued opportunities to sell ash for
6 beneficial reuse and will continue to do so as feasible. As the regulatory
7 requirements for ash reuse tightened, the Company limited its sale of ash to
8 situations in which compliance could be carefully monitored and to encapsulated
9 uses.

10 In summary, beyond the storage of fly ash and/or bottom ash, the operation
11 of ash basins has historically evolved to accept new CCR flows resulting from
12 FGD modifications required to address air emissions and also to accept other non-
13 CCR process flows, such as coal pile run-off and low volume wastewater. The
14 construction and use of the ash basins is the final step in the generation process
15 that has resulted in reliable, efficient, coal-fired electricity in the Carolinas for
16 many decades.

17 **Q. IS THERE ANY FUTURE FOR BENEFICIAL REUSE OF CCRs?**

18 A. Yes. As referenced above, Duke Energy has endeavored across its coal-fired
19 generating fleet to maximize the beneficial use of production ash and to reclaim,
20 where possible, stored ash for sale for beneficial use. Ash beneficiation for DE
21 Carolinas began in 1986/1987 at Belews Creek, selling ash for the cement
22 industry. From January 2016 through August 2018, 38 percent of the DE
23 Carolinas fleet production ash, or approximately 903,000 tons, was sold for

1 beneficial reuse to produce products such as a replacement for Portland Cement,
2 bricks, and blocks. It should be noted that the beneficial uses of ash for products
3 are limited based on the quality of the ash produced or stored, particularly the
4 carbon content, and the regional market demand. Also, beneficial use
5 opportunities as a structural fill are limited based on specific regional projects that
6 are in need and by statutory and regulatory requirements. Please refer to Kerin
7 Exhibit 7 for details on sales for beneficial use of production ash and stored ash in
8 the Carolinas.

9 **Q. WERE AND ARE THE COMPANY'S CCR HANDLING PRACTICES IN**
10 **ACCORDANCE WITH INDUSTRY PRACTICE AND REGULATORY**
11 **REQUIREMENTS?**

12 A. Yes. In 1988, the EPA submitted its Report to Congress on Wastes from the
13 Combustion of Coal by Electric Utility Power Plants ("1988 Report"). The 1988
14 Report is a comprehensive assessment of the electric utility industry's use of coal
15 and management of CCR up to that point in history. The 1988 Report found that
16 80 percent of CCR in the industry was being treated and stored in surface
17 impoundments or disposed of in landfills. Of those units, only 40 percent were
18 lined, either with a synthetic, clay, or composite liner. Historically, surface
19 impoundments were the single most widely used treatment and storage method
20 for CCR. At the time of the 1988 Report, landfilling of CCR was increasingly
21 common. As of 1988, Duke Energy was employing both surface impoundments
22 and landfills, which the 1988 Report noted were the most commonly used types of
23 treatment, storage, and disposal units used by the industry.

1 In the preamble to the CCR Rule, the EPA provided an updated assessment
2 of the coal-fired electric power industry. The CCR Rule details that in 2012
3 alone, over 470 coal-fired electric generating facilities burned over 800 million
4 tons of coal, generating approximately 110 million tons of CCR in 47 states and
5 Puerto Rico. In 2012, approximately 40 percent of the CCR generated were
6 beneficially used, with the remaining 60 percent treated and stored in CCR
7 surface impoundments; of that 60 percent, approximately 80 percent was stored in
8 onsite basins and landfills. Across the United States, CCR disposal currently
9 occurs at over 310 active onsite landfills, averaging over 120 acres in size with an
10 average depth of 40 feet and at over 375 active onsite surface impoundments.
11 Stated differently, the Company is re-using (selling) and storing CCR in the same
12 manner and at approximately the same percentages as the coal-fired utility
13 industry's national averages. Duke Energy's practices have been and continue to
14 be consistent with those of the industry.

15 Similar to the industry, DE Carolinas has onsite CCR landfills that are
16 actively receiving production fly ash and some bottom ash, at specific coal-fired
17 generating sites, including the Allen, Belews Creek, Cliffside and Marshall Plants
18 in the Carolinas. Also similar to the industry, DE Carolinas has active ash basins
19 that will receive bottom ash, and some fly ash, at specific coal-fired generating
20 sites through first quarter 2019. These sites include the Allen, Belews Creek,
21 Cliffside and Marshall Plants in the Carolinas. The ash handling practices for ash
22 basins and ash landfills in the Carolinas are consistent with the applicable
23 regulatory requirements that were in effect during the history of these CCR units.

1 **Q. ARE THE COMPANY’S CCR STORAGE AND HANDLING PRACTICES**
2 **CONSISTENT WITH THE PRACTICES OF OTHER DUKE ENERGY**
3 **AFFILIATES?**

4 A. Yes. The Company’s CCR storage and handling practices are consistent across
5 the Duke Energy fleet, including coal generation located in Florida and in the
6 Midwest. Duke Energy as it exists today has been formed over the years through
7 the mergers of several utilities with independently operated coal-fired generation,
8 including the Cinergy Corporation in 2006 and Progress Energy, Inc. in 2012.
9 Indeed, going farther back in time, Progress Energy, Inc. was created in 2000
10 from the merger of legacy utilities Carolina Power & Light (“CP&L”) and Florida
11 Power Corporation (“FPC”). Similarly, Cinergy Corporation was created in 1994
12 by the merger of legacy utilities Public Service Indiana (“PSI”) and Cincinnati
13 Gas & Electric Company (“CG&E”). Yet, the historical and current CCR
14 handling and use of CCR units is consistent across all of these legacy companies
15 that make up Duke Energy today, and consistent with the industry.

16 **III. NEW REQUIREMENTS REGARDING CCR AND ASH BASINS**

17 **Q. PLEASE DESCRIBE THE CCR COAL ASH REGULATORY**
18 **REQUIREMENTS.**

19 A. The CCR compliance requirements described below represent new regulatory
20 requirements that have significantly changed the operation and life cycle of the
21 onsite ash basins and ash landfills. The Company must comply with the CCR
22 Rule, South Carolina coal ash Consent Agreements and closure plans, CAMA in
23 North Carolina, and other agreements and court orders concerning the

1 management and disposal of CCR, operation and closure of CCR units, and
2 corrective action and post-closure care.

3 **Q. PLEASE SUMMARIZE THE MAJOR REQUIREMENTS UNDER THE**
4 **CCR RULE.**

5 A. The purpose of the CCR Rule is to protect groundwater and water quality near
6 CCR units and ensure stability of those units. The EPA's final CCR Rule
7 established national minimum criteria for CCR landfills and surface
8 impoundments that consist of: (1) location restrictions; (2) design and operating
9 criteria; (3) groundwater monitoring and corrective action; (4) closure
10 requirements and post-closure care; (5) recordkeeping; (6) notification; and (7)
11 Internet posting requirements. These requirements are summarized below, and
12 they result in different impacts at each CCR unit, depending on site-specific
13 factors.

14 The CCR Rule requires that new and existing CCR surface impoundments
15 and new CCR landfills and lateral expansions meet location restrictions for:
16 (1) placement above the uppermost aquifer; (2) wetlands; (3) fault areas; (4)
17 seismic impact zones; and (5) unstable areas. If a CCR basin does not meet the
18 location restrictions, then basin closure is required under the CCR Rule. The
19 specific location restriction assessments that are most likely to affect the
20 Company's CCR basins, because of typical geological characteristics and historic
21 groundwater elevations in the Carolinas, are placement above the uppermost
22 aquifer and wetlands.

1 The placement above the uppermost aquifer location restriction requires
2 that existing CCR basins be constructed with a base that is located no less than
3 1.52 meters (five feet) above the upper limit of the uppermost aquifer or
4 demonstrate that there will not be an intermittent, recurring, or sustained
5 hydraulic connection between any portion of the base of the CCR unit and the
6 uppermost aquifer due to normal fluctuations in groundwater elevations
7 (including the seasonal high water table).

8 The wetlands location restriction considers whether the CCR unit causes
9 or contributes to significant degradation to wetlands, and in the event of such
10 effects, sets out compensatory steps that may be taken to achieve no net loss of
11 wetlands in order to avoid basin closure.

12 The CCR Rule contains design criteria for new CCR landfills and lateral
13 extensions and new CCR surface impoundments, as well as structural integrity
14 criteria for new and existing CCR surface impoundments, including an
15 assessment of dam safety factors.

16 The CCR Rule contains operating criteria for fugitive dust control, run-on
17 and run-off controls for landfills, hydraulic capacity requirements for surface
18 impoundments, and inspection requirements for landfills and surface
19 impoundments. If the ash basin dam does not achieve the minimum factor of
20 safety requirements, then ash basin closure is required. The CCR Rule also
21 contains requirements for the assessment of groundwater impacts from CCR
22 landfills and surface impoundments. It provides requirements for the assessment
23 of corrective measures, selection of remedies, and implementation of corrective

1 action programs for identified groundwater impacts. Results of the groundwater
2 assessment may also require ash basin closure.

3 The CCR Rule contains requirements for how and when CCR basins must
4 be closed. It provides two alternatives for closure, "closure by leaving ash in
5 place" and "closure through removal of the CCR," also referred to as excavation.
6 In the case of closure by leaving ash in place, commonly referred to as "cap-in-
7 place," it provides design criteria for the closure cap system. Post-closure
8 monitoring requirements are also detailed in the CCR Rule. Lastly, the CCR Rule
9 requires: specific notifications, such as to state agencies; specific requirements
10 for record keeping, such as the written operating record; and, also, specific
11 requirements for posting information on a publicly accessible Internet site.

12 **Q. HOW ARE CCR CLASSIFIED UNDER THE CCR RULE?**

13 A. As stated in the CCR Rule, the EPA considers CCR to be a non-hazardous solid
14 waste.

15 **Q. HOW IS THE CCR RULE ENFORCED?**

16 A. The CCR Rule was promulgated as a self-implementing rule that could only be
17 enforced by citizen suit and not by administrative measures. However, the Water
18 Infrastructure Improvements for the Nation Act (WIIN Act), which was signed
19 into law in December 2016, gave the EPA immediate direct enforcement
20 authority, authorizes states to establish permit programs for implementing the
21 CCR Rule, and requires the EPA to do so, conditioned on federal funding, in those
22 states that do not adopt a CCR permit program.

1 **Q. TO WHICH DE CAROLINAS UNITS DOES THE CCR RULE APPLY**
2 **AND WHY?**

3 A. Pursuant to Section 257.50(b) of the CCR Rule, the requirements of the CCR
4 Rule apply to all owners and operators of new and existing landfills and surface
5 impoundments, including any lateral expansions of such units that dispose or
6 otherwise engage in solid waste management of CCR generated from the
7 combustion of coal at electric utilities and independent power producers.
8 Pursuant to Section 257.50(c), the CCR Rule also applies to inactive CCR surface
9 impoundments at active electric utilities or independent power producers,
10 regardless of the fuel currently used at the facility to produce electricity. When
11 the CCR Rule was promulgated, it contained a provision that excluded “legacy”
12 impoundments at sites where the utility had ceased producing electricity prior to
13 October 19, 2015, the effective date of the CCR Rule. *See* Section 257.50(e).
14 One DE Carolinas coal-fired generating site – the Riverbend Plant – qualified for
15 exemption under Section 257.50(e). The issue of whether the CCR Rule must
16 apply to impoundments at power plant sites that have ceased generating electricity
17 was litigated in the D.C. Circuit Court of Appeals in *Util. Solid Waste Activities*
18 *Group, et al., v. Env'tl. Prot. Agency*, 901 F. 3d 414 (D.C. Cir. 2018) (“*USWAG v.*
19 *EPA*”). In that case, environmental petitioners asserted that there was no rational
20 basis for excluding impoundments at inactive plants given that the CCR Rule
21 covers inactive impoundments at active facilities and, therefore, impoundments
22 such as those at the Riverbend Plant must be regulated pursuant to RCRA. In the
23 recently issued decision, the Court agreed with the position of the environmental

1 petitioners and determined that the EPA's decision to exclude legacy
2 impoundments from the CCR Rule was "arbitrary and capricious." The EPA is
3 expected to undertake an expedited rulemaking to bring these legacy
4 impoundments into the CCR Rule. Accordingly, as a result of the D.C. Circuit
5 Court of Appeals' decision, the CCR Rule will apply to all DE Carolinas sites.

6 **Q. IN ADDITION TO THE CCR RULE AND CAMA, IS THE COMPANY**
7 **SUBJECT TO SPECIFIC SOUTH CAROLINA COMPLIANCE**
8 **OBLIGATIONS CONCERNING THE MANAGEMENT OR**
9 **REMEDICATION OF CCR?**

10 A. Yes. DE Carolinas has other CCR-related obligations that result from South
11 Carolina environmental regulatory oversight under existing rules and regulations.
12 As noted above, in September 2014, the Company entered into the W.S. Lee
13 Consent Agreement with the SCDHEC applicable to ash management at the W.S.
14 Lee plant. The Consent Agreement requires the Company to excavate ash from
15 the W.S. Lee Plant's Inactive Ash Basin, the Ash Fill Area, and any other areas
16 where ash may have potentially migrated from these sites. This is in addition to
17 the Company's decision pursuant to the CCR Rule to excavate ash from the W.S.
18 Lee Plant's Primary and Secondary Ash Basins. DE Carolinas will be disposing
19 most of the ash in a lined CCR landfill. Approximately 1.6 million tons of ash
20 have been removed from the W.S. Lee Plant to date. Currently, DE Carolinas is in
21 the process of dewatering the basins in preparation for building the landfill and
22 resuming excavation activities.

1 **Q. PLEASE BRIEFLY SUMMARIZE THE MAJOR REQUIREMENTS**
2 **UNDER CAMA.**

3 A. CAMA requires closure of all ash basins in North Carolina, with the closure
4 option and closure deadline driven by a prioritization risk ranking classification
5 process. CAMA requires that all CCR ash basins be closed by dates ranging from
6 2019 to 2029. The law requires the cessation of storm water flows to CCR ash
7 basins and conversion to dry ash handling. Groundwater wells are required along
8 with monitoring and post-closure maintenance programs. CAMA also requires
9 that the Company provide permanent water supplies to all homeowners within an
10 established boundary of the ash basins. Lastly, the Company must install and
11 operate three ash beneficiation projects capable of annually processing 900,000
12 tons (300,000 tons from each site) of ash stored within the impoundments at the
13 site to specifications appropriate for cementitious products.

14 **Q. HOW IS CAMA ENFORCED?**

15 A. CAMA implementation in North Carolina is overseen by the Department of
16 Environmental Quality (“NCDEQ”), which has enforcement authority over
17 CAMA compliance issues.

18 **Q. TO WHICH DE CAROLINAS FACILITIES DOES CAMA APPLY?**

19 A. CAMA applies to all of DE Carolinas’ CCR surface impoundments in North
20 Carolina located at seven coal-fired generating sites.

1 **Q. SINCE CAMA ONLY APPLIES TO THE COMPANY’S NORTH**
2 **CAROLINA FACILITIES, HOW IS IT RELEVANT TO THIS SOUTH**
3 **CAROLINA RATE PROCEEDING?**

4 A. South Carolina customers receive the benefit from electricity generated at DE
5 Carolinas’ South Carolina and North Carolina plants; therefore, South Carolina
6 customers should also share costs from the generation process of electricity
7 production in both South Carolina and North Carolina. This issue is addressed in
8 greater detail in the direct testimony of Company Witness Wright.

9 **Q. DO THE CCR RULE, SOUTH CAROLINA REGULATORY POLICY, AND**
10 **CAMA REQUIRE CLOSURE OF THE COMPANY’S CCR BASINS?**

11 A. Yes. Under one or a combination of the above-listed federal and state regulatory
12 regimes, the Company will be required to close all of its CCR basins.

13 **Q. HOW DO THE CCR RULE AND STATE REGULATORY**
14 **REQUIREMENTS WORK TOGETHER TO ADDRESS MANAGEMENT**
15 **AND REMEDIATION OF THE COMPANY’S CCR BASINS?**

16 A. The CCR Rule requires DE Carolinas to comply with minimum national criteria,
17 as well as applicable state laws, in the closure of ash basins. Thus, the CCR Rule
18 provides overarching requirements pursuant to which each state may set forth
19 more specific regulations. However, as long as minimum national criteria are
20 satisfied, the CCR Rule does not specify a particular method for closing ash
21 basins. Thus, the CCR Rule leaves to the states to approve the method of ash
22 basin closure, as long as such method meets the timeframes and minimum
23 requirements set forth in the CCR Rule. In North Carolina, the method of closure

1 required under the CCR Rule will be selected through the process set forth in
2 CAMA. In addition, CAMA requires the submittal of detailed Corrective Action
3 Plans (“CAPs”) to NCDEQ to address groundwater impacts. CAMA sets forth
4 specific closure methods which are consistent with the CCR Rule’s minimum
5 national criteria for sites deemed intermediate risk. The CCR Rule regulates CCR
6 landfills in addition to CCR surface impoundments, whereas CAMA only
7 addresses CCR surface impoundments. Finally, South Carolina has required
8 utilities to excavate ash storage areas, which are exempt from CCR Rule
9 applicability because they ceased receiving CCR prior to the effective date of the
10 rule.

11 **Q. ARE THERE SOME SITES TO WHICH THE CCR RULE APPLIES, BUT**
12 **NOT TO EACH SPECIFIC CCR BASIN AT THAT SITE?**

13 A. Yes. After the D.C. Circuit Court of Appeal’s ruling in *USWAG v. EPA*, all of DE
14 Carolinas’ ash basins at its seven North Carolina sites are or soon will be subject
15 to the CCR Rule; however, the Inactive Ash Basin at the W.S. Lee Plant in South
16 Carolina is not subject to the CCR Rule because it did not contain liquids as of the
17 effective date of the CCR Rule. Please refer to Kerin Exhibit 5 for a detailed
18 breakdown of DE Carolinas’ ash basins in the Carolinas and which ash basins are
19 subject to the CCR Rule.

1 **Q. PLEASE EXPLAIN HOW THE COMPANY IS COMPLYING WITH ITS**
2 **COAL ASH REGULATORY OBLIGATIONS INCLUDING THE CCR**
3 **RULE, SOUTH CAROLINA OVERSIGHT, AND CAMA.**

4 A. DE Carolinas has reviewed and inventoried the applicable requirements to
5 determine the full scope of required actions to be taken by the Company, and the
6 limitations and/or constraints imposed by some of those requirements. The
7 Company intends to complete the most restrictive actions by the earliest
8 applicable due dates across these various compliance regulatory drivers.
9 Required actions and due dates are routinely monitored in various Duke Energy
10 management meetings in the CCP organization.

11 As an example, both CAMA and the CCR Rule require the development
12 of ash basin closure plans. CAMA, however, is more granular in the required
13 level of detail to be included in the narrative of the proposed closure plan as
14 compared to the CCR Rule. Conversely, the CCR Rule has a more limiting due
15 date for development of the ash basin closure plans. Therefore, for sites to which
16 both the CCR Rule and CAMA are applicable, the less granular closure plans
17 were developed to meet the CCR Rule's required due date of October 2016, while
18 more detailed closure plans are separately being developed to meet the exacting
19 requirements of CAMA by the December 2019 deadline.

20 As discussed above, the CCR Rule requires DE Carolinas to comply with
21 minimum national criteria, as well as any applicable state laws, in the closure of
22 ash basins. Thus, the CCR Rule leaves to the states to approve the method of ash
23 basin closure, as long as such method meets the timeframes and minimum

1 requirements set forth in the CCR Rule. In South Carolina, the method of closure
2 required under the CCR Rule was selected based on the Consent Agreement.

3 In addition to closure requirements, Duke Energy is complying with the
4 other CCR Rule requirements at its facilities in South Carolina, including its
5 groundwater monitoring and corrective action, recordkeeping, notification, and
6 Internet posting requirements.

7 Again, the Company will complete the most limiting action with respect to
8 closure method and timeframe.

9 **Q. IS THE COMPANY REQUESTING RECOVERY OF COSTS**
10 **ASSOCIATED WITH ITS OBLIGATIONS RELATED TO THE 2014 DAN**
11 **RIVER ASH RELEASE?**

12 A. No. On February 2, 2014, a release of coal ash into the Dan River occurred at the
13 Dan River Steam Station north of Eden, North Carolina. The Company
14 responded promptly to the Dan River release to repair plant equipment and
15 contain the release. The Company also worked with affected communities and
16 with environmental regulators to assess and address environmental impacts.

17 The Company has isolated costs related to this response and is not
18 requesting their recovery in this proceeding. We have also established unique
19 process codes for these costs to ensure they are not included in this case.

1 **IV. DUKE ENERGY'S COMPLIANCE PLANS**

2 **Q. HOW DO THE REQUIREMENTS UNDER THE CCR RULE, SOUTH**
3 **CAROLINA OVERSIGHT, AND CAMA AFFECT THE COMPANY'S**
4 **COAL-FIRED PLANTS?**

5 A. The CCR compliance requirements affect how the coal-fired power plants operate
6 and effectively require the coal ash basins to be retired. With regard to ash basin
7 operation, modifications to the power plants are required to direct storm water
8 flow away from the ash basins and to cease bottom ash and fly ash sluice flow to
9 the basins. As the ash basins are closed, other process streams, such as low-
10 volume wastewater, coal pile run-off, and FGD blowdown flows, must also be
11 directed away from the ash basins to facilitate de-watering and closure. As
12 detailed earlier in this testimony, the CCR Rule, South Carolina oversight, and
13 CAMA require closure of the ash basins; the timing and approach of these
14 closures is dictated by the most limiting regulatory requirement.

15 **Q. PLEASE DESCRIBE THE COMPANY'S ACTIVITIES UNDERTAKEN**
16 **PURSUANT TO ITS COAL ASH REGULATORY OBLIGATIONS.**

17 A. For each site, preliminary engineering and design work was performed to
18 determine the best ash basin closure option for the site as well as permitting
19 needs. Ash basin closure requires the removal of all in flows to the basin such as
20 sluiced ash, process water, and storm water prior to ash basin closure options of
21 excavation, cap in place, and/or beneficiation.

22 DE Carolinas' approach for closing specific CCR units has evolved over
23 time to meet the changing state and federal regulatory landscape. State-specific

1 regulatory obligations, such as the W.S. Lee Consent Agreement and CAMA,
2 provided additional clarity for developing closure options. Additionally, technical
3 investigations of groundwater, dam stability, and environmental concerns has
4 continued to inform the Company's decision-making.

5 For both state and federal regulatory obligations, a ground water
6 monitoring program has been established. This includes the installation of
7 numerous ground water wells and well monitoring for at least 30 years following
8 basin closure.

9 To comply with the federal CCR Rule's mandates on stopping flows to the
10 ash basins, many sites required modifications to convert to dry ash handling, new
11 or additional wastewater treatment, and rerouting of storm and process water
12 handling. These activities are largely complete at the DE Carolinas sites.

13 Once the basin in flows are stopped, the ash basin can then be closed by
14 excavation, cap in place, and/or beneficiation depending on engineering and
15 scientific analysis and regulatory requirements. For any of the closure methods,
16 the basin water must be treated and removed. Site Closure Plans and Site
17 Analysis and Removal Plans have been developed for each site and are attached
18 to my testimony as Kerin Exhibit 9. Kerin Exhibit 8 provides illustrations of the
19 technical approaches to the excavation and cap-in-place closure methods.

1 **Q. HAS THE REASONABLENESS AND PRUDENCY OF THE CLOSURE**
2 **OPTIONS THAT THE COMPANY HAS SELECTED FOR EACH SITE**
3 **BEEN FULLY EVALUATED AND SCRUTINIZED IN A PRIOR RATE**
4 **PROCEEDING?**

5 A. Yes. As I mentioned earlier, I testified on behalf of DE Carolinas in its North
6 Carolina rate case that was filed in 2017. Certain intervenors to the case hired
7 engineering consultants to review and critique the Company's decision-making
8 with regard to its selected CCR compliance options. The North Carolina Utilities
9 Commission held that DE Carolinas' selected closure options were reasonable and
10 prudent, with only limited exceptions. As an appendix to my testimony, I am
11 providing site-by-site summaries of each DE Carolinas site, which include
12 historical background, an explanation of the Company's selected closure option,
13 and an overview of the issues raised and decided in the North Carolina rate case.
14 *See Kerin Appendix.*

15 **Q. PLEASE PROVIDE THE COMPLIANCE COSTS RELATED TO ASH**
16 **POND CLOSURE REQUESTED FOR RECOVERY IN THIS CASE.**

17 A. DE Carolinas reasonably and prudently incurred and expects to incur a total of
18 \$958 million (on a system basis) related to incremental ash pond closure
19 compliance costs from January 2015 through December 2018. Company Witness
20 Smith describes the calculation of and the recovery requested related to this
21 deferred balance. These current and expected compliance activities are
22 reasonable, prudent, and cost-effective solutions given the individual
23 characteristics of each CCR plant and basin site.

1 **Q. HAS THE COMPANY IDENTIFIED ANY COSTS THAT IT WILL NOT BE**
2 **SEEKING FROM SOUTH CAROLINA CUSTOMERS?**

3 A. Yes. The Company will not be seeking from South Carolina customers certain
4 costs that are associated with the provision of drinking water to North Carolina
5 residents. These costs include the provision of bottled water and permanent
6 drinking water supplies, *e.g.*, connection to a public water supply or filtration
7 systems. The Company has decided to absorb the share of these costs that the
8 North Carolina Utilities Commission ordered should be allocated to South
9 Carolina.

10 **Q. HOW, IF AT ALL, DO THE COMPANY'S HISTORICAL CCR**
11 **PRACTICES IMPACT THE COMPLIANCE COSTS THAT DE**
12 **CAROLINAS IS SEEKING IN THIS PROCEEDING?**

13 A. They do not affect them at all. I make clear in prior sections of my testimony that
14 DE Carolinas' historical handling of CCRs was reasonable, prudent, and
15 consistent with industry standards over time. These facts are important to show
16 that nothing that DE Carolinas has done historically is causing the Company to
17 incur any unjustified costs today to comply with coal ash regulatory requirements.

18 **Q. REGARDING THE ASH POND CLOSURE COSTS ALREADY**
19 **INCURRED OR EXPECTED TO BE INCURRED PRIOR TO DECEMBER**
20 **2018, WHAT DO THOSE COSTS COMPRISE AND WHY ARE THEY**
21 **REASONABLE AND PRUDENT COSTS?**

22 A. In Kerin Exhibit 10, I have broken these costs down into their core components
23 and have described the plants to which these costs apply. In detailing these costs,

1 I have also provided narrative summaries as to why these costs were incurred and
2 why the compliance actions that led to those costs were the most reasonable and
3 cost-effective options given the applicable facts and circumstances. This exhibit,
4 coupled with the balance of my testimony and exhibits, demonstrate that these
5 costs are reasonable and prudent.

6 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

7 A. Yes.

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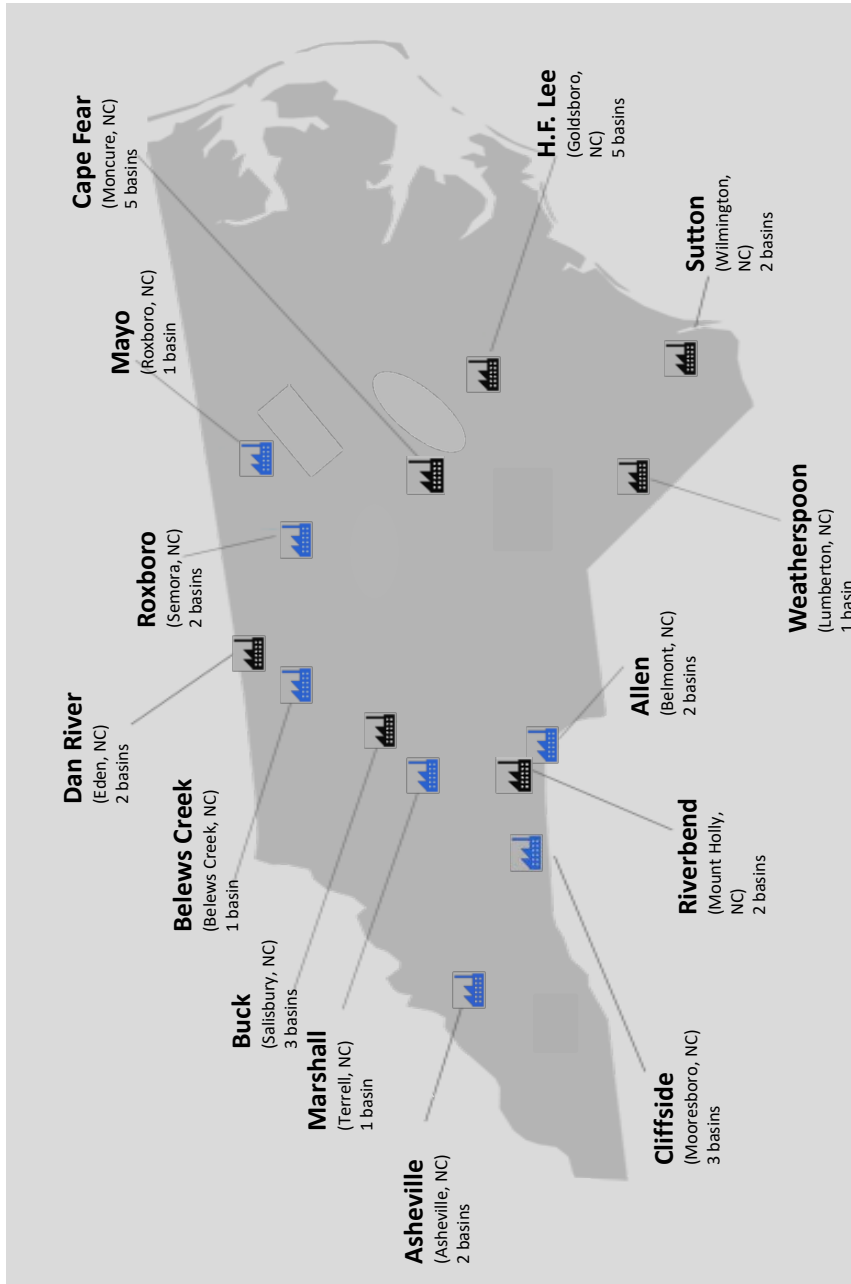
Kerin Exhibit 3
Page 1 of 2
Docket No. 2018-319-E

Duke Energy South Carolina Sites and Number of Ash Basins



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Kerin Exhibit 3
Page 2 of 2
Duke Energy North Carolina Sites and Number of Ash Basins



Kerin Exhibit 4
Page 1 of 1
Docket No. 2018-319-E

Site Facts - DEC

Site	Commercial Operation Date	Generation Capacity (MW)	Retirement Date, if applicable	Possible closure approach	Quantity of ash on site in basins at 7/31/18 (in million tons)	Is a CCR landfill envisioned for the site?
Allen	1957	1127	n/a	Cap in Place	16.6MT	No
Belews Creek	1974	2220	n/a	Cap in Place	12.0MT	No
Buck	1926	370	U3&4 -2011 U5&6 2013	Beneficiation	6.5MT	No
Cliffside 5	1972	1396	n/a	Cap in Place	7.4MT	No
Cliffside 1-4	1940	210	2011	Onsite landfill	0	Yes
Dan River	1949	290	2012	Offsite excavation/onsite landfill	1.1MT	Yes
Marshall	1965	2078	n/a	Cap in Place	16.8MT	No
Riverbend	1929	466	2013	Offsite excavation	.05MT	No
WS Lee	1951	200	2014	Onsite landfill	2.2MT	Yes

Note: quantities represent basin ash only and do not include fill or landfill ash quantities

					Kerin Exhibit 5
					Docket No. 2018-319-E
					Page 1 of 1
DEC					
Ash Basin Information					
Site	Basin	When constructed	Ash in Tons as of 7/31/18 (Millions)	When closed if applicable	CCR Applicable?
DEC					
Allen	Retired basin	1957	10.4	1973	Y
	Active Basin	1972	6.2	n/a	Y
Belews Creek	Active basin	1974	12	n/a	Y
Buck	Basin #1	1956	3.6	2013	Y
	Basin #2	1977	2	2013	Y
	Basin #3	1982	0.9	2013	Y
Cliffside	U1-4 inactive basin	1957	0	1977	Y
	U5 inactive basin	1970	2.4	1980	Y
	Active basin	1980	5	n/a	Y
Dan River	Primary basin	1956	0.7	2012	Y
	Secondary basin	1977	0.4	2012	Y
Marshall	Active basin	1965	16.8	n/a	Y
Riverbend	Primary and secondary basins	1957/1957	0.05	2014/2014	N/N
WS Lee	Primary basin	1974	2.2	2014	Y
	Secondary basin	1978	0.03	2014	Y
	1951/1959 inactive basin	1951	0	1974	N

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Kerin Exhibit 6
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Duke Energy Carolinas
Responses to Rule Changes Through the Decades

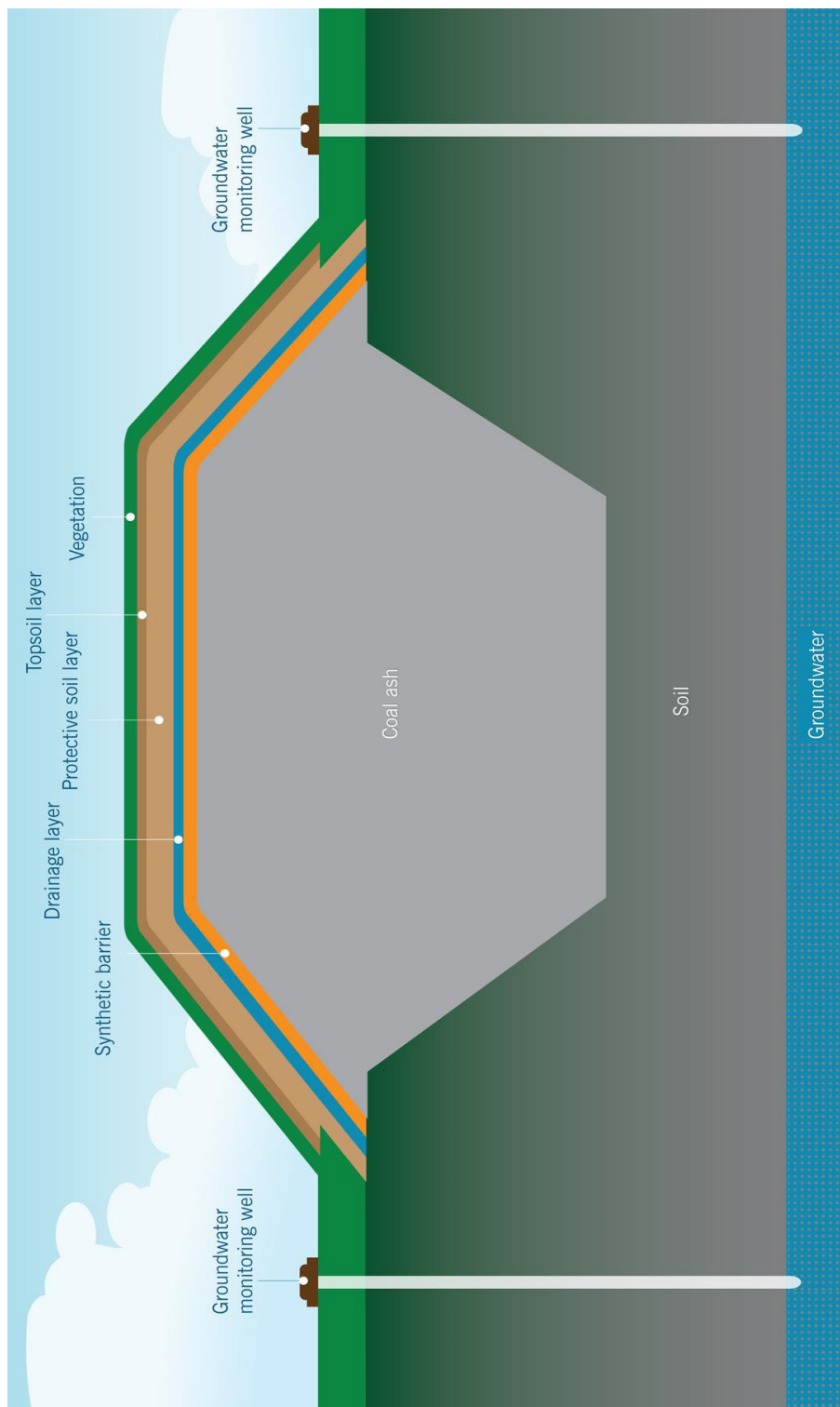
	1940s	1950s	1960s	1970s	1980s	1990s	2000s
Industry Standard	Fly ash discharged through smoke stacks. Bottom ash placed in landfills.	Fly ash discharged through smoke stacks. Water sluicing to ash basins for bottom ash.	Fly ash discharged through smoke stacks. Water sluicing to ash basins for bottom ash.	Fly ash discharged through smoke stacks. Water sluicing to ash basins for bottom ash.	Fly ash contained by ESPs. Water sluicing to ash basins for fly and bottom ash.	Fly ash contained by ESPs. Water sluicing to ash basins for fly and bottom ash.	Fly ash contained by ESPs. Water sluicing to ash basins for fly and bottom ash. Water sluicing to ash basins for FGD
DEC Coal Plants	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall Belews Creek	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall Belews Creek	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall Belews Creek	Cliffs (US only) Allen Marshall Belews Creek
DEC Ash Basins	None	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall Belews Creek	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall Belews Creek	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall Belews Creek	Buck Cliffs Dan River Allen Riverbend WS Lee Marshall Belews Creek
Law Changes	None	None	None	Clean Air Act Clean Water Act	Clean Air Act	None	CCR/CAMA
Industry Standard Changes	Water sluicing to ash basins	None	None	ESPs deployed on coal plants. NPDES/ELG permits and guidelines	FGD/Scrubbers to control sulfur emissions	None	Dry CCR handling or plant closure. Excavation and removal or cap in place for basins.
Plant and/or Basin Modifications	Water sluicing deployed to coal plants. Ash basins begin to be built	None	None	ESP's added to plants. Basin use conformed to NPDES/ELG permits and guidelines.	FGD/Scrubbers to some plants	FGD/Scrubbers to some plants	Dry CCR handling or plant closure. Excavation and removal or cap in place for basins.

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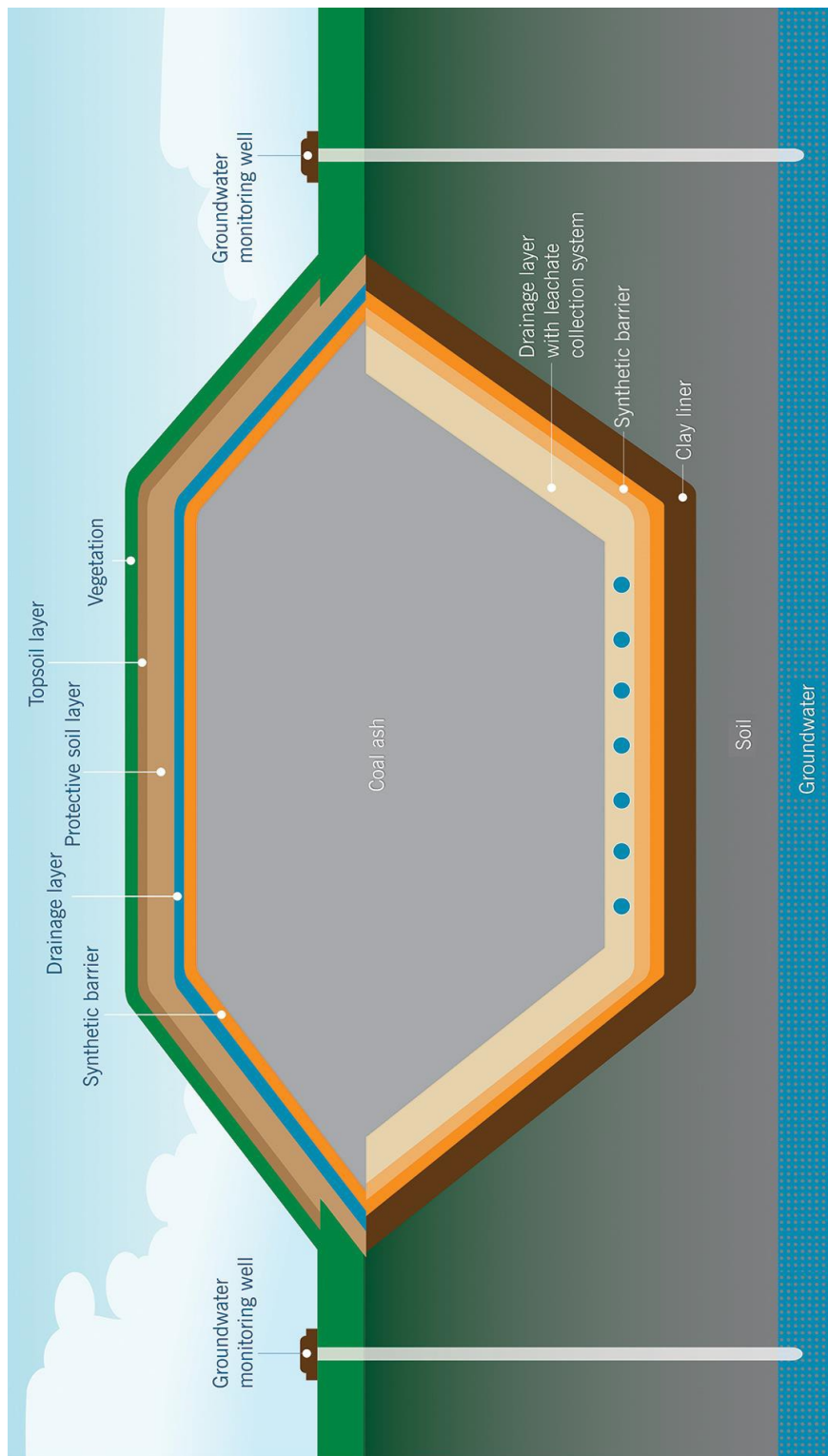
Duke Energy Corporation
Summary of Ash Beneficiation for Duke Energy Carolinas
2015 , 2016, 2017 and 2018 January to August

2015	DEC
Ash Produced	973,264
Production Ash Reused	375,934
Ash Sluiced	135,912
Ash Landfilled	781,320
Ash to Structural Fill	-
Reclaimed Ash for Beneficial Reuse	-
2016	DEC
Ash Produced	945,854
Production Ash Reused	362,050
Ash Sluiced	156,584
Ash Landfilled	748,803
Ash to Structural Fill	20,997
Reclaimed Ash for Beneficial Reuse	-
2017	DEC
Ash Produced	895,849
Production Ash Reused	346,900
Ash Sluiced	96,081
Ash Landfilled	720,772
Ash to Structural Fill	-
Reclaimed Ash for Beneficial Reuse	-
2018	DEC
Ash Produced	545,238
Production Ash Reused	194,465
Ash Sluiced	38,866
Ash Landfilled	550,685
Ash to Structural Fill	2,927
Reclaimed Ash for Beneficial Reuse	-

Closure options: engineered capping system



Closure options: fully lined landfill



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Duke Energy Carolinas Breakdown of 2015-August 31, 2018 Compliance Spend by site All numbers presented on a system basis		Docket No. 2018-319-E	
Site	2015 - August 31, 2018 compliance spend	Type of spend	Legal justification for spend
Allen	\$ 53,059,021	Ash closure development engineering; closure design drawings; wetland delineation; interstitial water and landfill leachate work; CAMA wells; alternate spillway; dam stability; groundwater; planning and overheads.	40 CFR 257.102(b) 40 CFR 257.60 40 CFR 257.101(b)(1) CAMA §§ 130A-309.213 and .214 HB 630 § 130A-309.211(c1)
			Allen is subject to CCR rule provisions requiring basin closure. 40 CFR § 257.102(b) required a written closure plan by October 17, 2016. On October 11, 2018, it was determined that both ash basins at the Allen plant did not meet the uppermost aquifer location restriction (40 CFR § 257.60). This results in the Allen station basins being required to commence closure pursuant to 40 CFR § 257.101(b)(1)(i) no later than October 31, 2020. The Allen plant is anticipating a low-risk ranking under CAMA in light of Duke Energy's completion of the dam safety activities required under NCGS § 130A-309.213(d)(1)b. and establishment of the permanent water supplies required under NCGS §§ 130A-309.211(c1) and 130A-309.213(d)(1)a. Engineering and project planning at the current time are needed to synchronize work between all of the coal ash sites being closed in the next 20 years, as well as to gain synergies between excavation/capping plans for all the sites. Closure plan preparation and submission is required by CAMA.
Belews Creek	\$ 50,535,423	Closure engineering; planning and overheads; CAMA and CCR wells; dam stability; groundwater activities.	40 CFR 257.102(b) 40 CFR 257.60 40 CFR 257.61 40 CFR 257.101(b)(1) CAMA §§ 130A-309.213 and .214 HB 630 § 130A-309.211(c1)
			Belews Creek is subject to CCR rule provisions requiring basin closure. 40 CFR § 257.102(b) required a written closure plan by October 17, 2016. On October 12, 2017, it was determined that the ash basin at the Belews Creek plant did not meet the wetlands location restriction (40 CFR § 257.61) and the uppermost aquifer location restriction (40 CFR § 257.60). This results in the Belews Creek ash basin being required to commence closure pursuant to 40 CFR § 257.101(b)(1) on April 12, 2019. The Belews Creek plant is anticipating a low-risk ranking under CAMA in light of Duke Energy's completion of the dam safety activities required under NCGS § 130A-309.213(d)(1)b. and establishment of the permanent water supplies required under NCGS §§ 130A-309.211(c1) and 130A-309.213(d)(1)a. Engineering and project planning at the current time are needed to synchronize work between all of the coal ash sites being closed in the next 20 years, as well as to gain synergies between excavation/capping plans for all the sites. Closure plan preparation and submission is required by CAMA.

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Duke Energy Carolinas Breakdown of 2015-August 31, 2018 Compliance Spend by site All numbers presented on a system basis			Docket No. 2018-319-E	
Site	2015 - August 31, 2018 compliance spend	Type of spend	Legal justification for spend	Spend justification
Buck	\$ 80,765,334	Closure plan development; wetlands delineation; dewatering; planning and overheads; CCR and CAMA wells; alternate spillway; beneficiation facility; groundwater; SW/PW reroute	40 CFR 257.102(b) 40 CFR 257.60 40 CFR 257.61 40 CFR 257.101(b) CAMA § 130A-309.213 and .214 HB630 §§ 130A-309.216	Buck is subject to CCR rule provisions requiring basin closure. 40 CFR § 257.102(b) required a written closure plan by October 17, 2016. On October 15, 2018, it was determined that the Additional Primary Pond and the Secondary Pond at Buck did not meet the wetlands location restriction (40 CFR § 257.61) and the uppermost aquifer location restriction (40 CFR § 257.60). This results in the additional primary pond and the secondary pond at Buck being required to commence closure pursuant to 40 CFR § 257.101(b)(1) on April 15, 2019. On October 15, 2018, it was also determined that the primary pond at Buck did not meet the uppermost aquifer location restriction (40 CFR § 257.60). This results in the Primary Pond at Buck being required to commence closure pursuant to 40 CFR § 257.101(b)(1)(i) no later than October 31, 2020. NC House Bill 630 mandated that three sites be identified for ash beneficiation (NCGS § 130A-309-216). Buck was chosen as one of those sites.
Cliffside	\$ 66,076,839	Ash excavation and transport (inactive ash basin); landfill activities to support excavation; planning and overheads; closure engineering; CAMA and CCR wells; alternate spillway; landfill; groundwater	40 CFR 257.102(b) 40 CFR 257.60 40 CFR 257.61 40 CFR 257.101(b)(1) CAMA §§ 130A-309.213 and .214 HB630 § 130A-309.211(c1)	Cliffside is subject to CCR rule provisions regarding basin closure. 40 CFR § 257.102(b) required a written closure plan by October 17, 2016. On October 11, 2018, it was determined that the Active Ash Basin and the Inactive Unit 5 Basin at Cliffside did not meet the wetlands location restriction (40 CFR § 257.61) and the uppermost aquifer location restriction (40 CFR § 257.60). This results in the Active Ash Basin and the Inactive Unit 5 Basin at Cliffside being required to commence closure pursuant to 40 CFR § 257.101(b)(1) on April 11, 2019. On November 3, 2016, the placement of wastestreams in the Inactive Units 1-4 Ash Basin ceased and closure of the basin commenced pursuant to 40 CFR § 257.102(e)(1)(i). The Cliffside plant is anticipating a low-risk ranking under CAMA in light of Duke Energy's completion of the dam safety activities required under NCGS § 130A-309.213(d)(1)b. and establishment of the permanent water supplies required under NCGS §§ 130A-309.211(c1) and 130A-309.213(d)(1)a. Engineering and project planning at the current time are needed to synchronize work between all of the coal ash sites being closed in the next 20 years, as well as to gain synergies between excavation/capping plans for all the sites. Closure plan preparation and submission is required by CAMA.

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Duke Energy Carolinas Breakdown of 2015-August 31, 2018 Compliance Spend by site All numbers presented on a system basis		Docket No. 2018-319-E		
Site	2015 - August 31, 2018 compliance spend	Type of spend	Legal justification for spend	Spend justification
Dan River	\$ 167,426,449	Ash excavation and transportation; purchase of land rights; dewatering; landfill; stormwater diversion; leachate removal; permits; planning and overheads; landfill development; closure plan; CAMA wells; dam stability; wastewater treatment; groundwater	40 CFR 257.102(b) 40 CFR 257.60 40 CFR 257.101(b)(1) 40 CFR 257.102(e)(1) CAMA §§ 3.(b) and 3.(c) Order Granting Motion for Partial Summary Judgment dated June 1, 2016 (No. 13-CVS-4061)	Dan River is subject to CCR rule provisions regarding basin closure. 40 CFR § 257.101(b) required a written closure plan by October 17, 2016. On October 11, 2018, it was determined that the Secondary Ash Basin at Dan River did not meet the uppermost aquifer location restriction (40 CFR § 257.60). This results in the basin being required to commence closure pursuant to 40 CFR § 257.101(b)(1)(i) no later than October 31, 2020. The last volume of CCR for beneficial use was removed from the Dan River Primary Ash Basin on April 4, 2018, and, within 30 days, the basin commenced closure pursuant to 40 CFR § 257.102(e)(1)(i). Pursuant to ¶ 5.e. of the Order Granting Motion for Partial Summary Judgment dated June 1, 2016 (No. 13-CVS-4061), a written Site Analysis and Removal Plan was due by December 31, 2016. Sections 3.(b) and 3.(c) of CAMA require excavation of the Dan River basins, with the ash disposed of in either an off-site or on-site landfill. (Dan River is a high-priority site, with ash basin closure required by August 1 2019.)
Marshall	\$ 43,212,613	Closure plan development; wetlands delineation report; CAMA wells; landfill activities; alternate spillway; dam stability; groundwater; planning and overheads.	40 CFR 257.102(b) 40 CFR 257.60 40 CFR 257.61 40 CFR 257.101(b)(1) CAMA §§ 130A-309.213 and .214 HB 630 § 130A-309.211(c1)	Marshall is subject to CCR rule provisions regarding basin closure. 40 CFR § 257.102(b) required a written closure plan by October 17, 2016. On October 12, 2018, it was determined that the ash basin at Marshall did not meet the wetlands location restriction (40 CFR § 257.61) and the uppermost aquifer location restriction (40 CFR § 257.60). This results in the Marshall ash basin being required to commence closure pursuant to 40 CFR § 257.101(b)(1) on April 12, 2019. The Marshall plant is anticipating a low-risk ranking under CAMA in light of Duke Energy's completion of the dam safety activities required under NCGS § 130A-309.213(d)(1)b. and establishment of the permanent water supplies required under NCGS §§ 130A-309.211(c1) and 130A-309.213(d)(1)a. Engineering and project planning at the current time are needed to synchronize work between all of the coal ash sites being closed in the next 20 years, as well as to gain synergies between excavation/capping plans for all the sites. Closure plan preparation and submission is required by CAMA.

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Duke Energy Carolinas		Breakdown of 2015-August 31, 2018 Compliance Spend by site		Docket No. 2018-319-E	
All numbers presented on a system basis					
Site	2015 - August 31, 2018 compliance spend	Type of spend	Legal justification for spend	Spend Justification	
Riverbend	\$ 316,680,565	Contractor mobilization; Brickhaven site preparation; Riverbend site preparation; excavation of CCR; transportation of CCR to Marshall, R&B Landfill, and Brickhaven; soil handling; interstitial water treatment equipment; engineering technical support; CAMA wells and groundwater	CAMA §§ 3.(b) and 3.(c) Order Granting Motion for Partial Summary Judgment dated June 1, 2016 (13-CVS-9352)	Riverbend is not currently subject to CCR rule provisions regarding basin closure. However, in response to the United States Court of Appeals for the District of Columbia Circuit's August 21, 2018 decision in <i>USWAG v. EPA</i> (No. 15-1219), EPA is expected to undertake a rulemaking that would regulate inactive impoundments at closed power plants, including the Riverbend basins. Pursuant to ¶ 5.e. of the Order Granting Motion for Partial Summary Judgment dated June 1, 2016 (13-CVS-9352), a written Site Analysis and Removal Plan was due by December 31, 2016. Sections 3.(b) and 3.(c) of CAMA require excavation of the Riverbend basins, with the ash disposed of in either an off-site or on-site landfill. (Riverbend is a high-priority site, with ash basin closure required by August 1 2019.)	
W.S. Lee	\$ 98,449,950	Contractor mobilization; readiness reviews; closure, drainage and road improvements; water treatment system; dewatering operations; ash removal; closure engineering; planning and overheads	40 CFR 257.102(b) 40 CFR 257.60 40 CFR 257.61 40 CFR 257.101(b)(1) Consent Agreement dated Sept. 29, 2014 (14-13-HW)	W.S. Lee is subject to CCR rule provisions regarding basin closure. 40 § CFR 257.102(b) required a written closure plan by October 17, 2016. On October 11, 2018, it was determined that the Secondary Ash Basin at W.S. Lee did not meet the wetlands location restriction (40 CFR § 257.61) and the uppermost aquifer location restriction (40 CFR § 257.60). This results in the Secondary Ash Basin at W.S. Lee being required to commence closure pursuant to 40 CFR § 257.101(b)(1) on April 11, 2019. On October 11, 2018, it was determined that the Primary Ash Basin at W.S. Lee did not meet the uppermost aquifer location restriction (40 CFR § 257.60). This results in the Primary Ash Basin at W.S. Lee being required to commence closure pursuant to 40 CFR § 257.101(b)(1) no later than October 31, 2020. Under a Consent Agreement (14-13-HW) executed between the South Carolina Department of Health and Environmental Control and Duke Energy Carolinas on Sept. 29, 2014), W.S. Lee ash basins must be excavated.	
Total - All Sites	\$ 876,206,194				

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Duke Energy Carolinas		Docket No. 2018-319-E	
Breakdown of 2015-August 31, 2018 Compliance Spend by site			
All numbers presented on a system basis			
Site	2015 - August 31, 2018 compliance spend	Type of spend	Spend Justification
Note:			
After the entry of summary judgment the HB630 amendments to CAMA codified this requirement. Session Law 2016-95, Section 3(a) and (b) (excerpted below). See references below in HB630 supporting the decision to			
SECTION 3.(a) Notwithstanding G.S. 130A-309.213 or G.S. 130A-309.214, as amended by Section 1 of this act, and except as otherwise preempted by the requirements of federal law, the following coal combustion			
(1) Coal combustion residuals surface impoundments located at the H.F. Lee Steam Station, owned and operated by Duke Energy Progress, and located in Wayne County.			
(2) Coal combustion residuals surface impoundments located at the Cape Fear Steam Station, owned and operated by Duke Energy Progress, and located in Chatham County.			
(3) Coal combustion residuals surface impoundments located at the Weatherspoon Steam Station, owned and operated by Duke Energy Progress, and located in New Hanover County.			
SECTION 3.(b) The impoundments identified in subsection (a) of this section shall be closed as follows:			
(1) Impoundments located in whole above the seasonal high groundwater table shall be dewatered. Impoundments located in whole or in part beneath the			
seasonal high groundwater table shall be dewatered to the maximum extent practicable.			
(2) All coal combustion residuals shall be removed from the impoundments and transferred for (i) disposal in a coal combustion residuals landfill, industrial landfill, or municipal solid waste landfill or (ii) use in a structural fill			
(3) If restoration of groundwater quality is degraded as a result of the impoundment, corrective action to restore groundwater quality shall be implemented by the owner or operator as provided in G.S. 130A-309.211.			

Exhibit 3.2: DEP Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy			Updated:	03/03/17	
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note)	Comments
Basin Closure Planning Activities:					
1	Engineering Analysis	Preliminary Engineering analysis to develop high level basin closure plans; this includes documentation requested/required by DEQ.	ARO	§ 130A-309.212.(a)	
2	Detailed engineering plans	Detailed engineering plans, drawings and estimates to develop the basin closure plan	ARO	§ 130A-309.212.(a)	
3	Groundwater wells to determine water flow	Installation of groundwater wells, to determine the direction of the flow of ground water, used in the development of closure plans	ARO	§ 130A-309.209, § 130A-309.212.(a)(3)b.	
4	Permitting activities	Costs to produce and submit documentation to obtain required permits	ARO	§ 130A-309.203.	
5	Closure plans	Labor to produce closure plans for submission to regulatory bodies	ARO	§ 130A-309.212.(a)	
6	Public meetings	Labor cost to plan/attend public meetings as required to obtain permits and closure plan approvals	ARO		
7	Corporate Communication	Community outreach and education/corporate communication	O&M	NA	These costs are not required to comply with law
8	Groundwater wells monitoring	Installation of groundwater wells, monitoring of results and 30 year maintenance	ARO	§ 130A-309.209, § 130A-309.212.(a)(3)b.	
9	Letter(s) of credit (3rd party) as needed		N/A	N/A	Cannot be charged to ARO; rather would be considered for inclusion in determining the credit-adjusted risk-free rate used for discounting
10	Engineering studies	Detailed engineering studies to support ARO/Regulatory estimates (internal or external)	ARO		
10-a	EPRI - Coal ash recycling technology and market study	Detailed coal ash recycling/beneficial reuse study required by CAMA	ARO		
11	Ash disposal/placement - "Tipping" fees at landfills	Costs to place materials at off-site or 3rd party owned landfills	ARO	§ 130A-309.212.(a)(1)a.&b.	
12	Charah Termination Fee	Fees to be paid to Charah in the event Duke does not meet the minimum ash storage tonnages, as identified in the contracts	ARO		Note: CCP Organization would have to demonstrate these were prudently incurred
13	Donations to counties or municipalities	Donations, charitable or otherwise in conjunction with ash contractual arrangements, not specified as an ash placement fee.	Other		These costs shall be charged to 426.1 Donations expense

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy			Updated:	03/03/17	
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note)	Comments
Basin Closure Planning Activities:					
14	ABSAT Team/Overhead (Elintsky)	Burdened labor allocated to ash basin closure (including expenses)	ARO	§ 130A-309.212.(a)	
15	General EH&S Activities	Compliance and research	ARO	§ 130A-309.212.(a)	
16	Program of record	Development of written program of record	ARO	§ 130A-309.212.(a)	
17	Finance support	Major Projects Finance	ARO	§ 130A-309.212.(a)	
18	Insurance Claim (Support)	Additional finance resources for pulling together coal ash-related insurance claims- time allocated for insurance claim support cannot be charged to ARO, and should be charged to Cap/O&M as appropriate. Insurance proceeds will be netted against Cap/ O&M accounts initially charged for claim support labor, and any insurance proceeds exceeding time charged to Cap/O&M accounts will be credited back to ARO Reg Asset, reducing customer receivable	CAP/ O&M		
19	Supply Chain support	Procurement, contract administration	ARO	§ 130A-309.212.(a)	
20	Project controls oversight	Monitor, control, report, and communicate status of Project scope, schedule, and cost. The PCS works with the PM to provide financial, schedule, and / or risk analyses throughout the lifecycle of the Project.	ARO	§ 130A-309.212.(a)	
21	Contractor review of beneficial reuse	Contractor hired to review and make recommendation on the bid proposals we received on beneficial reuse. CAMA required that Duke solicit bids to enhance our beneficial reuse of ash.	O&M		This activity is similar to preliminary studies where we haven't yet selected the contract, but when the actual implementation of a contract for beneficial reuse is utilized for the removal of ash, then those costs can be recorded as an ARO.
22	Landfill - Operating plant	Construction of landfill including permit, land acquisition, design - for disposal of future dry ash only	CAP	§ 130A-309.208.	Please note - Subtitle D will have closure requirements of the landfill - once the landfill is constructed an ARO to close that landfill must be recorded.
23	Landfill - Retired plant	Construction of landfill including permit, land acquisition, design - for disposal of existing ash	ARO	§ 130A-309.212.(a)(1)b.	
24	Landfill - Operating plant - combined use	Construction of landfill including permit, land acquisition, design - for disposal of existing wet and future dry ash combined	ARO	§ 130A-309.212.(a)(1)b.	Includes Gallagher LF expansion engineering analysis/ infrastructure development
25	Landfill cell closure		ARO	§ 130A-309.212.(a)(1)a.	

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy		Updated:	03/03/17		
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MMA/CCR Rule reference (Note	Comments
Basin Closure Planning Activities:					
26	Movement of non-basin historical ash into landfill	Ash found on-site (non-production ash) and moved into on-site landfills, essentially used as fill material to close the landfill	ARO		
27	Post closure maintenance	Post closure maintenance of landfills as required by law	ARO	§ 130A-309.212.(a)(1)a.	Section 257.104(c) of CCR
28	Build Haul roads	Construction of haul roads to/from ash basin	ARO	§ 130A-309.212.(a)(1)a.&b.	
29	Duke labor costs	Duke labor, including burdens and expenses per Duke policy	ARO	§ 130A-309.212.(a)(1)a.&b.	
30	EPC Staff		ARO	§ 130A-309.212.(a)(1)a.&b.	
31	Engineering Procurement & Construction Management		ARO	§ 130A-309.212.(a)(1)a.&b.	
32	Safety Staff		ARO	§ 130A-309.212.(a)(1)a.&b.	
33	QA/QC Plan Development and Execution		ARO	§ 130A-309.212.(a)(1)a.&b.	
34	Field Construction staff		ARO	§ 130A-309.212.(a)(1)a.&b.	
35	Stabilization activities:	Dam stabilization to support timing/approach of basin closure (ex. Animal holes, large vegetation removal (e.g., trees))	ARO	§ 130A-309.212.(a)(4)	Supports operation/stabilization of basin or dam until timing of closure.
36	Dam breaching	Activities to prevent dam from breaching	ARO	§ 130A-309.212.(a)(4)	Supports operation/stabilization of basin or dam until timing of closure.
37	Dike butrous		ARO	§ 130A-309.212.(a)(4)	Supports operation/stabilization of basin or dam until timing of closure.
38	Erosion control	Ex. "rip rap" - which is a temporary structure that is removed after subsequent phases to stabilize and prevent erosion	ARO	§ 130A-309.212.(a)(4)	Supports operation/stabilization of basin or dam until timing of closure.
39	Material relocation/ grading		ARO	§ 130A-309.212.(a)(4)	Supports operation/stabilization of basin or dam until timing of closure. This can be a dam stabilization activity and can also be associated with other CCP work.
40	Seed/mulch area		ARO	§ 130A-309.212.(a)(4)	Supports operation/stabilization of basin or dam until timing of closure. This can be a dam stabilization activity and can also be associated with other CCP work.
41	Sheet Piling	Structural stabilization of dam walls	ARO	§ 130A-309.212.(a)(4)	Supports operation/stabilization of basin or dam until timing of closure.

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy		Updated:	03/03/17		
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note	Comments
Basin Closure Planning Activities:					
42	Valves on settling ponds	These slide gate isolation valves provide the site with the ability to control flow into the weir boxes, which then discharges into the river or other body of water. During an emergency event, these slide gate isolation valves are used to stop the flow from the ash basin to the river, which helps to mitigate the risk of an unpermitted environmental discharge.	ARO	§ 130A-309.212.(a)(4)	Supports operation/stabilization of basin or dam until timing of closure.
43	Import fill/excavate fill or clay/dirt backfill		ARO	§ 130A-309.212.(a)(4)	This can be a dam stabilization activity and can also be associated with other CCP work.
44	Dewatering/Dewatering plan	Includes removal or grout of old stormwater pipes to the ash basin to stop water flow into basin	ARO	§ 130A-309.212.(a)(1)	This includes the temporary system for ROB-121 which is a project to eliminate the discharge flow
45	Dust Control		ARO	§ 130A-309.212.(a)	
46	Excavation of ash ponds/stacks/materials	includes excavation on in scope ponds that are removed to build retention ponds	ARO	§ 130A-309.212.(a)(1)b.	
47	Fill pond area and grade to drain		ARO	§ 130A-309.212.(a)(1)	
48	Grout fractured rock		ARO	§ 130A-309.212.(a)(4)	
49	Loading and hauling of ash materials		ARO	§ 130A-309.212.(a)(1)a.&b.	
50	Mobilization/demobilization	Mobilization and demobilization of work crews and projects on site (includes on site trailers)	ARO	§ 130A-309.212.(a)(1)a.&b.	
51	Rail Loading and unloading		ARO	§ 130A-309.212.(a)(1)a.&b.	
52	Rail heads and spur construction	Includes renovation, rail transportation and/or rail leases	ARO	§ 130A-309.212.(a)(1)a.&b.	ARO accounting is precedent over lease accounting
53	Remove wetlands		ARO	§ 130A-309.212.(a)(1)a.&b.	
54	Restore ash stack area and cinder pit area		ARO		
55	Site stormwater controls	including redirection of storm and waste water as required to close basin	ARO	§ 130A-309.208.(c)& (d)	
56	Redirection of water from CC/CC sites	Redirection of water that is currently running into ash ponds that need to be dewatered. Includes new piping and avoids continuing to flow water into basin	ARO	§ 130A-309.208.(c)& (d)	
57	Synthetic capping	"cap in place"	ARO	§ 130A-309.212.(a)(1)a.	More detail may be needed on technologies

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy		Updated:	03/03/17		
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note	Comments
Basin Closure Planning Activities:					
58	Truck wash/rail wash stations		ARO	§ 130A-309.212.(a)(1)a.&b.	
59	Truck/weigh scales	Scales used for weighing ash, including scales located on and off Duke property	ARO	§ 130A-309.212.(a)(1)a.&b.	
60	Vacuum wells		ARO	§ 130A-309.212.(a)(1)a.&b.	
61	Extraction wells and groundwater monitoring	Installation of extraction wells to pump the groundwater to arrest the off-site migration. Includes treatment of the pumped groundwater as needed to meet standards and returned either to the ash basin or the discharge canal. Maintain operation of wells until cleared by DEQ.	ARO		Required by DEQ
62					
63	Coal Combustion Products Organization - Overhead allocated to ash basin closure:				
64	CCP Staff - burdened labor including expenses	Burdened labor allocated to ash basin closure (including expenses)	ARO		
65	General EH&S Activities		ARO		
66	Supply Chain function - procurement, contract admin		ARO		
67	Finance support, Major Projects Finance	Direct cost support including contract support, project support, budget support and financial support	ARO		
68	Project controls oversight	Direct project controls support including contract support, project support, budget support and financial support	ARO		
69	Governance & Ops Support (Kerin)	Burdened labor allocated to ash basin closure (including expenses)			
70	Quality Compliance and Oversight	This organization performs quality assurance and control activities to support the CCP & ABSAT organizations for ash basin closure. Responsible for field verification and report closeout. This team supports both ash basins and cooling ponds and activities can be easily segregated.	ARO		

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy		Updated:	03/03/17		
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note)	Comments
Basin Closure Planning Activities:					
71	Regulatory Affairs Filing and Support	This organization ensures that CCP/CAMA regulatory requirements are implemented, tracked and documented. They are tasked with maintaining the operational record by facility and submittal of documents to the regulator as required.	ARO		
72	Governance & Ops Support	This organization develops and documents the System Owner and business processes, including emergency preparedness and response.	O&M		Corporate based support
73	Organization Effectiveness	This organization is the internal controls for operations - responsible for human performance, Corrective Action Program (CAP or "root cause"), performance reporting and self-assessments.	O&M		Corporate based support
74	Emergency Preparation Plan Development	Development of Emergency Action Plans (EAPs) across CCP fleet for CCR units classified as high or significant hazard potential, in accordance with CCR Rule.	O&M		
75	<u>Engineering (related to as basins/in scope impoundments) (Renner):</u>				
76	CCR Related engineering – post April 17th	Burdened labor allocated to ash basin closure (including expenses)	ARO		
77	CCR Activities prior to April 17 th including engineering studies specific only to CCR		O&M		
78	Project Engineering		ARO		
79	Outsourced engineering services		ARO		
80	Configuration Management		ARO		
81	Regional Engineering Services		ARO		
82	Geotechnical Engineering		ARO		
83	<u>Project Management & Implementation (Emergent projects related to ash removal – Murray)</u>				
84	Project initiation – Ash ponds and landfills		ARO		
85	Development of scope documents		ARO		

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy			Updated:	03/03/17	
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note)	Comments
Basin Closure Planning Activities:					
86	Project Controls	Scheduling and Estimating, Cost Management	ARO		
87	Project Managers, direct labor and expenses	Effective leadership and accountable for project outcomes	ARO		
88	Project Portfolio management		ARO		
89	Groundwater monitoring wells installation	- CAMA requirements	ARO	§ 130A-309.209, § 130A-309.212.(a)(3)b.	
90	Groundwater monitoring wells installation	- capturing results, analysis and required reporting – CAMA	ARO	§ 130A-309.209, § 130A-309.212.(a)(3)b.	
91	Groundwater wells	- 30 year post monitoring maintenance	ARO	§ 130A-309.209, § 130A-309.212.(a)(3)b.	
92	Groundwater Additional Source Wells (NC)	Wells to be drilled outside of basins (such as coal piles, gypsum storage areas and cooling ponds) in order to test for coal ash constituents. Data will be provided to NCDEQ in the Comprehensive Site Assessment.	ARO		Wells are needed in order to provide sampling data to the NCDEQ- closure cannot be completed without these additional source wells
93	<u>Operations & Maintenance Activities</u> (related to ash basins/in scope impoundments – Weisker):				
94	Plant demolition activities	Final dismantlement of generation plant	COR		
95	*By Products and Reagents Technical Support		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
96	*Vegetation management on ash basins and landfills		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
97	*QA field testing on CCR	This activity includes compaction of fill to meet standards	ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
98	Daily/Weekly/Monthly Inspections (vendor vs. "System Owners")		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
99	Visual observations of leak detection system		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
100	Camera inspection of leachate header and sumps		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy		Updated:	03/03/17		
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note	Comments
Basin Closure Planning Activities:					
101	Inspect landfill features: leachate, sumps, conveyance system, E&SC structures, dust control and storm water control		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
102	Inspect for erosion, weeds, and other vegetation		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
103	Removal of trees greater than 2 inches in diameter		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
104	Mitigation of animal burrows	Basin stability for timing of closure	ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
105	Clean out of LCS Leachate header pipes and sumps		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
106	Annual topographic survey and capacity analysis		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
107	Annual Operational Report preparation and submittal		ARO	§ 130A-309.212.(a)(3)b.	* Need to quantify non-incremental and incremental portion.
108	Wet CCR Ash Basin Support	– daily logs, water levels discharge, water samples	O&M	NA	
109	Regulatory reqmnts and permit maint – solid waste		O&M	NA	
110	Purchase of mowers to comply with CAMA/CCR		ARO	§ 130A-309.212.(a)(3)b.	
111	Clarifying pond maintenance	This activity includes the annual maintenance, such as pond dredging, for ponds. These are not ash basin ponds	O&M	NA	
112	Operations and Maintenance Manuals (by station)	Detailed documentation of all of the Ash Basin facilities at each site of the inspection, operating and monitoring requirements	O&M	NA	
113	Repairs to landfill caps not subject or required by CCR	Repairs to existing assets, not intended for dam stabilization (ex. Pine Hall Road Landfill at Belews Creek)	O&M	NA	
114	Dam breaching for purpose of new plant construction	Dam breaching/ ash excavation and compaction of soil to required 90% density= ARO; incremental compaction over 90% requirement= Capital	CAP/ARO		* Need to quantify non-incremental and incremental portion.
115	Non-Ash Basin Management:				

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy		Updated:	03/03/17		
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note	Comments
Basin Closure Planning Activities:					
116	Vegetation management for cooling ponds and other non-ash areas		O&M		
117	Gypsum Stackers Pad Construction		CAP		
118	Calibration of truck scales (for gypsum)		O&M		
119	Preparation and submittal of annual reports		O&M		
120	Fly ash silo unloading, equipment maintenance, inspection and calibration		O&M		
121	Haul road monitoring and maintenance	Maintenance/Repairs of haul roads- O&M. Activities such as paving may qualify for Capital treatment (capital project is subject to normal capitalization rules- see Company's Capitalization Policy).	CAP/ O&M		
122	Cooling Pond maintenance (Phase 4/5 - no ash in pond)		O&M		
123	Air quality projects – permits		O&M		
124					
Operating Plant conversion requirements:					
126	Dry Fly Ash or Bottom Ash Handling Conversion	– modifications to plant equipment	CAP	\$ 130A-309.208.(e)	Required for continued operation of plant - avoid if closing plant
127	Dry bottom ash handling	– wet rim ditch alternate solution	CAP	\$ 130A-309.208.(f)	
128	Dry bottom ash handling	– submerged flight conveyor system	CAP	\$ 130A-309.208.(f)	
129	Water Retention pond and related new piping	For redirection of water that can no longer go to wet ash basins Constructed in order to support the on-going operations of an operating plant to be used to accumulate storm water and waste water streams that would not have sufficient CCR material to be considered a location subject to the CCR retirement closure requirements	ARG-CAP		Required to close basin ("shut off the faucet")- Required for on-going operations at the plant site for storm and wastewater streams.

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines				
Duke Energy			Updated:	03/03/17
Coal Ash Charging Guidelines				
Below is a listing of activities considered for closure of Ash Basins				
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note)
Basin Closure Planning Activities:				
130	Ash Pond Level Instrumentation	Instruments to provide remote monitoring to detect surface water levels in the ponds, which will be communicated to a central server system for monitoring.	CAP/ O&M	Active Plant- Capital; Retired Plant- O&M
131	Transmission lines/towers located in ash basins	Costs to construct new relocated line/tower = capital; cost to remove tower in order to close basin = ARO	CAP/ARO	Capital project is subject to normal capitalization rules.
132	Transmission and Distribution Related Activities	Costs relating to the construction of new assets to support on-going T&D activities- Capital. Costs to remove T&D assets to support basin closure- ARO.	CAP/ARO	Capital project is subject to normal capitalization rules.
133	Other:			
134	Groundwater remediation	Environmental remediation activity	Environ Res	Note: This would apply to plants without a closure obligation
135	Bottled water to residents	Providing bottled water to residents	ARO	Required by HB630- temporary supply until residents are permanently connected to a municipal water line
136	Beneficial reuse (not Asheville)	Projects promoting public health and environmental protection, offering equivalent success relative to other alternatives, and preserving natural resources	ARO	\$ 130A-309.212.(a)(1)b.
137	Beneficiation Facilities	Includes Engineering Analysis and Construction	ARO	Required per HB 630- supports closure timing and risk ranking
138	NC CAMA - Regulatory fee	"shall only be used to pay the expenses of the Coal Ash Management Commission and the DEQ in providing oversight of coal combustion residuals." (Fee = 0.03% of NC revenues for DEP/DEC)	Other	Prohibits the NCUC/SCPSC from allowing utilities to recover this fee
139	Land purchases for groundwater remediation	Duke will purchase property adjoining our plants with contaminated groundwater to remediate groundwater	ARO	
140	Land purchases due to fugitive landfill dust	Duke will purchase property adjoining our plants due to fugitive dust coating neighboring properties from the construction of a landfill (Cliffside)	Other	Note: Until the land is re-purposed and is used and useful for plant operations, this shall be charged to FERC account 121 (Nonutility property)

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy		Updated:	03/03/17		
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note	Comments
Basin Closure Planning Activities:					
141	Permanent Connections to (Municipal) Water Supply	Costs of providing permanent, alternative water supplies to neighbors within a half mile of ash basin compliance boundaries by Oct 2018. ARO activities include the following: Costs incurred to connect households to the water lines or to install whole house filtration systems, reimbursements to homeowners for installation of water filtration system or connection to municipal water system after receiving Do Not Drink letters (prior to passage of HB630). Payments to periodic maintenance on whole house filter systems, Water Testing for residents within a half mile of the basins in order to determine if the appropriate water filter is in place	ARO		Required per HB 630- supports risk rankings and closure method
142	Permanent Connections to (Municipal) Water Supply for residents across a body of water	Groundwater testing for all residents across the body of water is chargeable as ARO. If testing/data shows that groundwater is flowing underneath the river and contamination is present, permanent water source connections are chargeable to ARO. If no contamination is present, connections to permanent water supply should be charged as O&M.	ARO/ O&M		Pertains to Asheville residents located across the French Broad river
143	Compensation Packages to Homeowners within a half mile of ash basins	Goodwill payment (currently estimated to be \$5,000 per household), stipend for 25 years of water bills, Property Value Protection Plan (PVPP) program costs through 10/2019	O&M		
144	Closure work – out of scope basins (unless or until closure plan creates legal obligation – record ARO evaluate recovery)				
145	Beckjord evaluation		O&M		

Exhibit 3.2: DEC Response to SCORS Interrogatory 1-22 Charging Guidelines					
Duke Energy			Updated:	03/03/17	
Coal Ash Charging Guidelines					
Below is a listing of activities considered for closure of Ash Basins					
Ln#	Activity	Long Description	Charge Category	MA/CCR Rule reference (Note	Comments
Basin Closure Planning Activities:					
146	Crystal River/Florida CCR evaluation	Ash storage disposal area landfill was specifically identified on the CCR rule website, so costs to close this will be ARO. The FGD blow down pond is also in scope of CCR, however, has minimal material and is disposed in a short period of time and therefore is being charged to expense.	ARO		
147	Dresser Indiana	Evaluated to be ARO; see 4Q16 memo XXXX	ARO		Site evaluation is still being performed and final facts/ circumstances could potentially change classification
148	Noblesville Indiana	Groundwater monitoring well installation/ monitoring/ sampling/ bottled water	O&M		Site evaluation is still being performed and final facts/ circumstances could potentially change classification
149	Kokomo Indiana		O&M		
Note 1: Please note, as of current, this is not an all-inclusive list					

Exhibit 3.3: DEC and DEP Response to SCORS Interrogatory 9-06 Coal Ash Spend

Duke Energy Corporation												
ARO Spend and Incremental CAMA Only Costs (2018 Actuals and Forecast)												
10/31/2018												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DE Carolinas												
Total ARO Spend (includes BR and CAMA only)	\$ 17,423,735	\$ 14,752,019	\$ 22,561,107	\$ 19,947,247	\$ 15,860,446	\$ 23,844,290	\$ 15,966,233	\$ 20,184,874	\$ 23,572,411	\$ 22,410,178	\$ 17,809,853	\$ 17,809,853
Beneficial Reuse- Dan River	\$ 33,674	\$ 37,954	\$ 28,696	\$ 44,093	\$ 55,046	\$ 63,017	\$ 77,043	\$ 87,048.71	\$ 63,359.09	\$ 76,691.96	\$ 87,048.71	\$ 87,049
DEC CAMA Only Costs												
CAMA Wells	\$ 585,815	\$ 683,752	\$ 641,357	\$ 522,838	\$ 1,547,575	\$ 773,237	\$ 344,350	\$ 300,787	\$ 1,041,031	\$ 1,312,732	Not needed	Not needed
CAMA Wells - Retired	\$ 340,422	\$ 264,236	\$ 343,786	\$ 57,801	\$ 239,869	\$ 26,250	\$ 277,326	\$ 218,489	\$ 104,481	\$ 581,952		
Total CAMA Wells	\$ 926,237	\$ 947,987	\$ 985,142	\$ 580,639	\$ 1,787,444	\$ 799,488	\$ 621,676	\$ 519,276	\$ 1,145,512	\$ 1,894,684		
Bottled Water	\$ 8,475	\$ 89,462	\$ 85,781	\$ 167,483	\$ 65,070	\$ 12,434	\$ 77,535	\$ 1,634	\$ 21,716	\$ 3,998		
Bottled Water - Retired	\$ 2,877	\$ 44,315	\$ 36,607	\$ 81,406	\$ 41,507	\$ 3,462	\$ 70,954	\$ 5,484	\$ 26,008	\$ 1,387		
Total Bottled Water	\$ 11,351	\$ 133,777	\$ 122,388	\$ 248,889	\$ 106,577	\$ 15,897	\$ 148,490	\$ 7,118	\$ 47,725	\$ 5,385	\$ 281,300	\$ 281,300
Municipal Water Supply	\$ 1,765,024	\$ 1,466,998	\$ 1,976,398	\$ 2,046,910	\$ 1,438,838	\$ 1,333,847	\$ 889,321	\$ 483,699	\$ 594,030	\$ 144,057		
Municipal Water Supply - Retired	\$ 52,400	\$ 91,521	\$ 38,783	\$ 458,651	\$ 403,024	\$ 1,938,553	\$ 1,376,041	\$ (193,240)	\$ (196,759)	\$ 741,381		
Total Municipal Water Supply	\$ 1,817,425	\$ 1,558,519	\$ 2,015,181	\$ 2,505,561	\$ 1,841,862	\$ 3,272,400	\$ 2,265,362	\$ 290,459	\$ 397,270	\$ 885,438	\$ 4,560,256	\$ 4,560,256
Total CAMA - DE Carolinas	\$ 2,755,013	\$ 2,640,284	\$ 3,122,712	\$ 3,335,089	\$ 3,735,883	\$ 4,087,785	\$ 3,035,528	\$ 816,853	\$ 1,590,507	\$ 2,785,507	\$ 4,841,555	\$ 4,841,555
South Carolina SC1800 Input												
SC1800-Col. A-System Spend excl CAMA	\$ 15,594,959	\$ 13,059,722	\$ 20,423,538	\$ 17,192,797	\$ 13,912,007	\$ 20,555,993	\$ 13,552,381	\$ 19,887,297	\$ 23,127,416	\$ 21,519,355	\$ 12,968,298	\$ 12,968,298
SC1800-Col. B-CAMA only costs	\$ 1,828,776	\$ 1,692,296	\$ 2,137,570	\$ 2,754,450	\$ 1,948,439	\$ 3,288,297	\$ 2,413,852	\$ 297,577	\$ 444,995	\$ 890,823	\$ 4,841,555	\$ 4,841,555
DE Progress												
Total ARO Spend (includes BR and CAMA only)	\$ 12,291,062	\$ 14,772,451	\$ 16,919,255	\$ 13,501,818	\$ 17,222,390	\$ 14,102,375	\$ 10,594,665	\$ 19,262,600	\$ 14,525,712	\$ 18,571,283	\$ 38,420,849	\$ 38,420,849
Beneficial Reuse- Weatherspoon	\$ 613,720	\$ 303,373	\$ 855,932	\$ 714,401	\$ 852,651	\$ 918,344	\$ 716,982	\$ 1,075,444	\$ 207,642	\$ 770,623	\$ 577,069	\$ 577,069
DEP CAMA Only Costs												
CAMA Wells - Active	\$ 69,708	\$ 283,599	\$ 610,339	\$ 248,060	\$ 1,037,455	\$ 435,278	\$ 112,983	\$ 689,054	\$ 552,143	\$ 158,403	Not needed	Not needed
CAMA Wells - Retired	\$ 262,984	\$ 231,339	\$ 101,728	\$ 550,352	\$ 201,040	\$ 163,270	\$ 475,949	\$ 206,461	\$ 466,022	\$ 158,572		
Total CAMA Wells	\$ 332,692	\$ 514,938	\$ 712,066	\$ 798,412	\$ 1,238,495	\$ 598,549	\$ 588,932	\$ 895,515	\$ 1,018,165	\$ 316,975		
Bottled Water - Active	\$ 1,527	\$ 26,573.79	\$ 24,616.09	\$ 52,689.50	\$ 23,896	\$ 434	\$ 34,784	\$ 184	\$ 19,043	\$ 4,932		
Bottled Water - Retired	\$ 1,661	\$ 5,609	\$ 3,894	\$ 8,853	\$ 1,637	\$ 257	\$ 2,020	\$ 6	\$ 2,908	\$ 1,120		
Total Bottled Water	\$ 3,189	\$ 32,183	\$ 28,510	\$ 56,542	\$ 25,532	\$ 691	\$ 36,804	\$ 190	\$ 21,951	\$ 6,052		
Municipal Water Supply - Active	\$ 26,554	\$ 15,333.63	\$ 17,345.26	\$ 34,106.38	\$ 2,104,298	\$ (1,370,850)	\$ 179,235	\$ 294,757	\$ 137,879	\$ 242,005		
Municipal Water Supply - Retired	\$ 170,430	\$ 141,980	\$ (90,930)	\$ 157,709	\$ 243,646	\$ (107,072)	\$ (49,251)	\$ 13,686	\$ 217,789	\$ 73,553		
Total Municipal Water Supply	\$ 196,985	\$ 157,514	\$ (73,585)	\$ 191,815	\$ 2,347,944	\$ (1,477,921)	\$ 129,984	\$ 308,443	\$ 355,668	\$ 315,558		
Total CAMA - DE Progress	\$ 532,865	\$ 704,635	\$ 666,991	\$ 1,046,769	\$ 3,611,972	\$ (878,681)	\$ 755,720	\$ 1,204,149	\$ 1,395,783	\$ 638,584	\$ -	\$ -
South Carolina SC1800 Input												
SC1800-Col. A-System Spend excl CAMA	\$ 12,090,888	\$ 14,582,754	\$ 16,964,329	\$ 13,253,460	\$ 14,848,913	\$ 15,579,605	\$ 10,427,877	\$ 18,953,966	\$ 14,148,093	\$ 18,249,673	\$ 38,420,849	\$ 38,420,849
SC1800-Col. B-CAMA only costs	\$ 200,173	\$ 189,697	\$ (45,075)	\$ 248,358	\$ 2,373,477	\$ (1,477,230)	\$ 166,788	\$ 308,634	\$ 377,619	\$ 321,610	\$ -	\$ -

Duke Energy Progress
Ash Management ARO Cash Flows Summary
Detail Tab Footnotes
as of September 30, 2018

Note: Certain types of actual amounts may not be in the same categories as forecasted amounts

- a. Basin Closure includes a contingency estimate for discrete items
- b. Coal Combustion Products (CCP) Basin Support Projects estimate reflects CCR related support projects affecting the timing or method of closure (ex. Dam stability projects)
- c. EHS - Environmental, Health and Safety: estimate includes well installation, well sampling (groundwater monitoring), bottled water and permanent water supplies
- d. Post-Closure Maintenance - 30 years of required costs post-closure
- e. Landfill Closure - estimated cash flows for landfill AROs initially recorded before CAMA and CCR (not included in Cost of Removal depreciation rates)
- f. Remaining Current Year Forecast - includes contingency
- g. Inflation Impacts - compounded inflation impacts

Exhibit 3.4.0: Summary of DEP ARO Cash Flows Response to SCORS Interrogatory 10-08																
Duke Energy Progress																
Ash Management ARO Cash Flows Summary																
System Level																
As of 9/30/18																
w/ inflation																
Total Project Costs (2015+)	\$ 452,038,793	\$ 191,934,196	\$ 24,187,676	\$ 82,788,175	\$ 40,931,030	\$ 44,027,315	\$ 260,104,597	\$ 22,261,993	\$ 64,563,236							
	206,749,586	25,384,168	7,342,989	7,524,374	5,880,434	4,636,371	181,365,418	9,165,451	14,317,607							
Roxboro	349,803,401	34,070,691	7,806,769	12,563,556	7,167,110	6,533,256	315,732,710	6,366,469	16,220,154							
Total Operating Plants	1,008,591,780	251,389,055	39,337,434	102,876,105	53,978,574	55,196,942	749,360,288	37,793,913	95,100,997							
Retired																
Cape Fear	504,918,488	33,631,199	7,705,330	8,346,981	6,815,029	10,763,860	471,287,289	18,325,181	116,714,502							
Hf Lee (NC)	568,383,919	54,775,180	7,260,508	13,498,675	13,416,419	20,599,578	513,608,739	21,923,632	120,532,835							
Robinson (SC)	179,561,777	11,431,675	2,581,604	3,834,014	2,090,145	2,925,911	168,130,102	10,866,681	34,194,657							
Sutton	493,219,171	255,525,554	37,189,549	79,669,346	104,689,533	33,977,126	237,693,617	19,844,924	75,735,546							
Weatherspoon	209,724,346	28,287,429	4,489,006	4,631,236	9,438,277	9,728,910	181,436,918	7,036,705	17,895,496							
Total Retired Plants	1,955,807,702	383,651,037	59,368,227	109,838,022	136,449,403	77,995,385	1,572,156,665	77,997,123	365,072,836							
Total Duke Energy Progress	\$ 2,964,399,482	\$ 635,040,092	\$ 98,705,661	\$ 212,714,127	\$ 190,427,977	\$ 133,192,326	\$ 2,329,359,390	\$ 115,791,036	\$ 460,173,833							

FN - Please see Footnotes tab for further explanations

Exhibit 3.4.2 Mayo ARO Cash Flows - DEP Response to SCORS 10-08									
Duke Energy Progress									
CCR ARO Project Cost Estimates - Mayo									
As of 9/30/18									
Item		Actual 2015	Actual 2016	Actual 2017	Actual 1/1 - 9/30/18	Forecast 10/1 - 12/31/18	Forecast 2019		
Basin Closure	Total	\$ 75,886,139	a	\$ -	\$ -	\$ -	\$ 8,020,511		
CCP Basin Support Projects		9,438,996	b	-	-	-	4,594,284		
EHS		27,234,666	c	-	-	-	1,380,911		
Post-Closure Maintenance		15,916,872	d	-	-	-	-		
Landfill Closure		6,516,820	e	-	-	-	-		
Spend To Date		25,384,168		7,342,989	7,524,374	4,636,371	-		
Remaining Current Year Forecast		9,165,451	f	-	-	-	9,165,451		
Inflation Impacts		37,206,475	g	-	-	-	-		321,901
Total Mayo	\$ 206,749,586	\$ 7,342,989	\$ 7,524,374	\$ 5,880,434	\$ 4,636,371	\$ 9,165,451	\$ 14,317,607		
FN - Please see Footnotes tab for further explanations									

Exhibit 3.4.3 Roxboro ARO Cash Flows - DEP Response to SCORS 10-08									
Duke Energy Progress									
CCR ARO Project Cost Estimates - Roxboro									
As of 9/30/18									
Item	Total	FN	Actual 2015	Actual 2016	Actual 2017	Actual 1/1 - 9/30/18	Forecast 10/1 - 12/31/18	Forecast 2019	
Basin Closure	\$ 127,819,202	a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,522,625	
CCP Basin Support Projects	12,979,686	b	-	-	-	-	-	9,376,822	
EHS	55,431,571	c	-	-	-	-	-	1,956,031	
Post-Closure Maintenance	17,774,002	d	-	-	-	-	-	-	
Landfill Closure	19,172,064	e	-	-	-	-	-	-	
Spend To Date	34,070,691		7,806,769	12,563,556	7,167,110	6,533,256	-	-	
Remaining Current Year Forecast	6,366,469	f	-	-	-	-	6,366,469	-	
Inflation Impacts	76,189,715	g	-	-	-	-	-	364,676	
Total Roxboro	\$ 349,803,401		\$ 7,806,769	\$ 12,563,556	\$ 7,167,110	\$ 6,533,256	\$ 6,366,469	\$ 16,220,154	
FN - Please see Footnotes tab for further explanations									

Exhibit 3.4.5 HF Lee ARO Cash Flows - DEP Response to SCORS 10-08										
Duke Energy Progress										
CCR ARO Project Cost Estimates - HF Lee										
As of 9/30/18										
Item										
	Total	FN	Actual 2015	Actual 2016	Actual 2017	Actual 1/1 - 9/30/18	Forecast 10/1 - 12/31/18	Forecast 2019		
Basin Closure	\$ 387,784,401	a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 115,439,726		
CCP Basin Support Projects	5,214,096	b	-	-	-	-	-	1,057,904		
EHS	19,249,026	c	-	-	-	-	-	1,325,278		
Post-Closure Maintenance	10,332,942	d	-	-	-	-	-	-		
Landfill Closure	-	e	-	-	-	-	-	-		
Spend To Date	54,775,180		7,260,508	13,498,675	13,416,419	20,599,578	-	-		
Remaining Current Year Forecast	21,923,632	f	-	-	-	-	21,923,632	-		
Inflation Impacts	69,104,642	g	-	-	-	-	-	2,709,927		
		g	-	-	-	-	-	-		
Total Marshall	\$ 568,383,919		\$ 7,260,508	\$ 13,498,675	\$ 13,416,419	\$ 20,599,578	\$ 21,923,632	\$ 120,532,835		
FN - Please see Footnotes tab for further explanations										

Exhibit 3.4.6 Robinson ARO Cash Flows - DEP Response to SCORS 10-08										
Duke Energy Progress										
CCR ARO Project Cost Estimates - Robinson										
As of 9/30/18										
Item	Total	FN	Actual 2015	Actual 2016	Actual 2017	Actual 1/1 - 9/30/18	Forecast 10/1 - 12/31/18	Forecast 2019		
Basin Closure	\$ 123,149,703	a	\$ -	\$ -	\$ -	\$ -	-	\$ 32,817,857		
CCP Basin Support Projects	166,265	b	-	-	-	-	-	50,053		
EHS	12,194,921	c	-	-	-	-	-	557,952		
Post-Closure Maintenance	3,764,217	d	-	-	-	-	-	-		
Landfill Closure	-	e	-	-	-	-	-	-		
Spend To Date	11,431,675		2,581,604	3,834,014	2,090,145	2,925,911	-	-		
Remaining Current Year Forecast	10,866,681	f	-	-	-	-	10,866,681	-		
Inflation Impacts	17,988,315	g	-	-	-	-	-	768,795		
Total Robinson	\$ 179,561,777		\$ 2,581,604	\$ 3,834,014	\$ 2,090,145	\$ 2,925,911	\$ 10,866,681	\$ 34,194,657		
FN - Please see Footnotes tab for further explanations										

Exhibit 3.4.7 Sutton ARO Cash Flows - DEP Response to SCORS 10-08											
Duke Energy Progress											
CCR ARO Project Cost Estimates - Sutton											
As of 9/30/18											
Item											
	Total	FN	Actual 2015	Actual 2016	Actual 2017	Actual 1/1 - 9/30/18	Forecast 10/1 - 12/31/18	Forecast 2019			
Basin Closure	\$ 151,788,408	a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 69,901,593			
CCP Basin Support Projects	4,818,558	b	-	-	-	-	-	2,813,396			
EHS	25,360,989	c	-	-	-	-	-	1,317,607			
Post-Closure Maintenance	11,299,529	d	-	-	-	-	-	-			
Landfill Closure	-	e	-	-	-	-	-	-			
Spend To Date	255,525,554		37,189,549	79,669,346	104,689,533	33,977,126	-	-			
Remaining Current Year Forecast	19,844,924	f	-	-	-	-	19,844,924	-			
Inflation Impacts	24,581,210	g	-	-	-	-	-	1,702,750			
Total Sutton	\$ 493,219,171	g	\$ 37,189,549	\$ 79,669,346	\$ 104,689,533	\$ 33,977,126	\$ 19,844,924	\$ 75,735,346			
FN - Please see Footnotes tab for further explanations											

Exhibit 3.4.8 Weatherspoon Cash Flows - DEP Response to SCORS 10-08									
Duke Energy Progress									
CCR ARO Project Cost Estimates - Weatherspoon									
As of 9/30/18									
Item	Total	FN	Actual 2015	Actual 2016	Actual 2017	Actual 1/1 - 9/30/18	Forecast 10/1 - 12/31/18	Forecast 2019	
Basin Closure	\$ 112,823,615	a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 16,039,468	
CCP Basin Support Projects	4,009,116	b	-	-	-	-	-	409,708	
EHS	16,211,492	c	-	-	-	-	-	1,043,977	
Post-Closure Maintenance	10,183,220	d	-	-	-	-	-	-	
Landfill Closure	-	e	-	-	-	-	-	-	
Spend To Date	28,287,429		4,631,236	4,489,006	9,438,277	9,728,910	-	-	
Remaining Current Year Forecast	7,036,705	f	-	-	-	-	7,036,705	-	
Inflation Impacts	31,172,769	g	-	-	-	-	-	402,343	
Total Weatherspoon	\$ 209,724,346		\$ 4,631,236	\$ 4,489,006	\$ 9,438,277	\$ 9,728,910	\$ 7,036,705	\$ 17,895,496	
FN - Please see Footnotes tab for further explanations									

		Duke Energy Progress ARO Coal Ash Deferral (South Carolina Retail)													
Line No.	Description	Coal Ash ARO System Spend			(c) % to SC for Spend	(d)=(i) Prior Mth + (l) Prior Month	(e)=(a)×(c) SC Spend excludes CAMA Overcollections	(f) NDTF	(g) Active Plant COR Offset	(h) Retired Coal Ash Plant COR Offset	(i)=sum of (d) thru (h) Balance for Return	(j) = (i) × cost of debt	(k) = (i) × cost of equity	(l)=(j)+(k)	(m)=(l)+ total to date col (l)
		(a) System Spend excl CAMA	(b) CAMA Only Costs	(c) %											
Note 3															
1		\$	22,904,533	\$	-	9.704%	-	2,222,656	(387,621)		1,835,035	1,749	8,186	9,934	1,844,969
2	Jul-16					9.704%	1,844,969	2,102,795	(387,621)		3,560,143	3,393	15,881	19,274	3,579,417
3	Aug		21,669,364	-		9.704%	3,579,417	1,669,106	(387,621)		4,470,348	4,260	19,941	24,201	4,494,550
4	Sept		17,200,184			9.704%	4,494,550	1,438,456	(387,621)	(296,518)	5,545,385	5,284	24,737	30,021	5,575,406
5	Oct		14,823,333	7,583		9.704%	5,575,406	1,438,300	(387,621)		6,626,085	6,314	29,558	35,872	6,661,957
6	Nov		19,071,049	38,509		9.704%	6,661,957	1,850,655	(387,621)	(296,518)	7,734,438	7,370	34,502	41,872	7,776,310
7	Dec		18,212,544	12,213		9.710%	7,776,310	1,103,724	-		8,880,034	8,462	39,612	48,074	8,928,108
8	Jan-17		11,366,877	12,213		9.710%	8,928,108	1,768,438	-		10,696,546	10,193	47,716	57,908	10,754,455
9	Feb		18,212,544	43,020		9.710%	10,754,455	1,555,174	-	(296,518)	11,919,076	11,358	53,169	64,527	11,983,603
10	March		16,016,207	79,891		9.710%	11,983,603	1,586,223	-		13,569,826	12,931	60,533	73,464	13,643,290
11	April		21,335,977	58,443		9.710%	13,643,290	2,041,979	-	(296,518)	15,685,268	14,947	69,969	84,916	15,770,184
12	May		12,029,645	71,401		9.710%	15,770,184	1,705,418	-		17,085,050	16,281	76,214	92,494	17,177,544
13	June		17,563,524	46,178		9.710%	17,177,544	1,450,072	-		18,627,616	17,751	83,095	100,845	18,728,461
14	July		14,933,803	72,122		9.710%	18,728,461	1,688,057	-		20,416,518	19,455	91,075	110,530	20,527,048
15	Aug		17,384,726	67,508		9.710%	20,527,048	1,383,593	-	(296,518)	21,520,088	20,507	95,998	116,504	21,636,592
16	Sept		14,249,151	127,108		9.710%	21,636,592	1,413,305	-		23,049,897	21,965	102,822	124,786	23,174,683
17	Oct		14,555,146	61,009		9.710%	23,174,683	1,058,327	-		24,233,011	23,092	108,099	131,191	24,364,202
18	Nov		10,899,356	26,442		9.710%	24,364,202	1,660,598	-	(298,701)	25,631,339	24,425	114,337	138,762	25,770,100
19	Dec		17,101,938	112,710		9.710%	25,770,100	1,154,430	-		26,924,530	31,183	120,106	151,289	27,075,819
20	Jan-18		12,090,888	200,173		9.548%	27,075,819	1,392,351	-	(296,418)	28,468,170	32,971	126,992	159,963	28,628,133
21	Feb		14,582,754	189,697	(45,075)	9.548%	28,628,133	1,619,742	-		29,857,455	34,580	133,189	167,769	30,025,224
22	March		16,964,329	(48,075)	248,358	9.548%	30,025,224	1,265,431	-		31,290,655	36,240	139,582	175,822	31,466,477
23	April		13,253,460	248,358		9.548%	31,466,477	1,417,764	-		32,884,241	38,085	146,691	184,777	33,069,018
24	May		14,848,913	2,373,477		9.548%	33,069,018	1,487,530	-		34,556,548	154,151	164,773	34,750,721	34,750,721
25	June		15,579,605	(1,477,230)		9.548%	34,750,721	995,646	-		35,746,367	41,400	159,459	200,859	35,947,226
26	July		10,427,877	166,788		9.548%	35,947,226	1,809,712	-		37,756,938	43,729	168,427	212,156	37,969,094
27	Aug		18,953,966	308,634		9.548%	37,969,094	1,350,850	-		39,319,944	45,539	175,400	220,939	39,540,883
28	Sept		14,148,093	377,619		9.548%	39,540,883	3,036,655	-		42,577,538	49,312	189,931	239,243	42,816,781
29	Oct		31,804,327	-		9.548%	42,577,538	3,036,655	-		45,614,193	53,106	204,545	257,650	45,871,843
30	Nov		31,804,327	-		9.548%	45,871,843	3,036,655	-		48,908,498	56,921	219,240	276,161	49,184,659
31	Dec		31,804,327	-		9.548%	48,908,498	-	-		49,423,903	57,241	220,472	277,713	49,701,616
32	Jan-19					9.548%	49,701,616	-	-		49,701,616	57,563	221,711	279,273	49,980,889
33	Feb					9.548%	49,980,889	-	-		49,980,889	57,886	222,956	280,843	50,261,732
34	March					9.548%	50,261,732	-	-		50,261,732	58,211	224,209	282,421	50,544,153
35	April					9.548%	50,544,153	-	-		50,544,153	58,539	225,469	284,008	50,828,160
36	May					9.548%									

Note 1: Active Plant COR is used to offset the ARO for purposes of calculating a return - amounts per books through Mar 15 2018
Note 2: Retired Plant COR is used to offset the ARO for purposes of calculating a return - amounts per books through Mar 15 2018
Note 3: DPALL Production Demand allocation factors
Note 4: SC-1804 Cost of Removal annual estimates/4 for quarterly bookings; COR is part of the new depreciation study effective 3/15/2018
Note 5: Cost of debt and equity for each year of the deferral is represented on SC 1804
Note 6: Assumes Rates effective date of 6/1/2019
Note 7: The 2016 SC Rate case included coal ash spend through June, 2016.

Asheville Prudence Disallowance
Balance for Amortization
(1,516,933)
49,311,227

Coal Ash Non ARO System														
Line No.	Description	(a)	(b)	(c)	(d)=(a)x (c)	(e)=(b)x (c) / 2	(f) = YTD (k)	(g)=sum of (d) thru (f)	(h) = (g) x cost of debt	(i) = (g) x cost of equity	(j)=(h)+(i)	(k)	(l)=(j)+(k) x cost of capital/2	(m)=(l) + (k) + (i)
		System Plant Balance	Plant Adds	% to SC for Spend	SC Plant Balance	SC Plant Adds	Accumulated Depreciation	Rate Base for Return	Deferred Cost of Debt	Compounded monthly Deferred Cost of Equity	Total Cost of Capital	Deferred Depreciation	After tax return on Deferred Expenses	Ending Balance
		Note 1	Note 2	Note 3	Note 4	Note 4	Note 4	Note 5	Note 5	Note 5	Note 6	Note 6	Mid-Month convention	
1		\$	-	9.548%	\$	1,865	-	\$	2.9	\$	11.1	\$	0.0	\$
2	Jan-18	39,059	3,766	9.548%	3,729	180	(9)	3,900.27	6	23	23	29.20	9	52.21
3	Feb	42,825	170	9.548%	4,089	8	(21)	4,076.46	12	24	30.52	0.41	94.84	94.84
4	March	42,995	9,154	9.548%	4,105	437	(35)	4,507.12	7	27	33.74	14	0.67	143.71
5	April	52,149	5,917,390	9.548%	4,979	282,493	(51)	287,421.85	444	1,708	2,151.92	16	6.90	2,318.07
6	May	5,969,539	84,954	9.548%	569,966	4,056	(3,155)	570,866.87	881	3,393	4,274.07	3,104	33.75	9,730.00
7	June	6,054,493	54,017	9.548%	578,077	2,579	(6,303)	574,352.69	886	3,414	4,300.17	3,148	75.60	17,254.18
8	July	6,108,511	100,202	9.548%	583,234	4,784	(9,477)	578,540.69	893	3,439	4,331.52	3,174	118.04	24,878.09
9	Aug	6,208,713	70,890	9.548%	592,802	3,384	(12,704)	583,482	900	3,468	4,369	3,227	161.13	32,634.35
10	Sept	6,279,603	5,781,000	9.548%	599,570	275,982	(14,608)	860,945	1,329	5,117	6,446	1,904	206.83	41,190.69
11	Oct	12,060,603	81,424,201	9.548%	1,151,534	3,887,151	(18,264)	5,020,421	7,747	29,840	37,588	3,656	347.33	82,781.94
12	Nov	93,484,804	78,181,474	9.548%	8,925,836	3,732,344	(46,603)	12,611,577	19,462	74,961	94,423	28,340	810.05	206,354.17
13	Dec	171,666,277		9.548%	16,390,524	-	(98,643)	16,291,861	25,141	96,836	121,977	52,040	1,648.40	382,019.51
14	Jan-19			9.548%	16,390,524	-	(150,683)	16,239,841	25,061	96,527	121,587	52,040	2,634.37	558,281.20
15	Feb	171,666,277		9.548%	16,390,524	-	(202,723)	16,187,801	24,960	96,217	121,198	52,040	3,623.69	735,142.58
16	March	171,666,277		9.548%	16,390,524	-	(254,763)	16,135,762	24,900	95,908	120,808	52,040	4,616.38	912,807.03
17	April	171,666,277		9.548%	16,390,524	-	(306,803)	16,083,722	24,820	95,599	120,419	52,040	5,612.46	1,090,677.94
18	May													
19														
20		\$ 994,674,677	#####		\$ 94,970,543	\$ 8,195,262	\$ (1,124,844)	\$ 157,466	\$ 606,513	\$ 763,979	\$ 306,803	\$ 19,896		
Note 1: Beginning balance Provided by Asset Accounting														
Steam Production composite depreciation rate														
Source: SC-1002 - Steam Production plant col 3														
Used for forecasted months depreciation expense														
3.81%														

Note 1: Beginning balance Provided by Asset Accounting
Note 2: Actual through June provided by Asset Accounting
Note 3: DPALL Production Demand allocation factors
Note 4: Assumes mid month convention on plant adds
Note 5: Cost of debt and equity for each year of the deferral is represented on SC 1804
Note 6: Total cost of capital after tax from SC 1804
Note 7: Assumes Rates effective date of 6/1/2019

Steam Production composite depreciation rate
Source: SC-1002 - Steam Production plant col 3
Used for forecasted months depreciation expense

Duke Energy Progress, LLC
Docket No. 2018 – 318 – E
Amortize deferred environmental costs
For the test period ended December 31, 2017

SC-1804
Page 1 of 1

Cost of debt and Equity for coal ash deferral periods

1						
2				July 2016 - Dec 2016		
3		Ratio	APPROVED	WEIGHTED COST OF CAPITAL		
4			COST RATE	RETURN	AFTER TAX	BEFORE TAX
5		1	2	3=1*2	4	
6	LONG TERM DEBT	47.00%	3.94%	1.8518%	1.1435%	1.8518%
7	EQUITY	53.00%	10.10%	5.3530%	5.3530%	8.6700%
8	TOTAL	100.00%		7.2048%	6.4965%	10.5218%
9						
10	Return on Equity		2.557%			
11						
12	Effective State and Federal Income Tax Rate		38.25%	5		
13						
14						
15						
16				Jan-Dec 2017		
17		Ratio	APPROVED	WEIGHTED COST OF CAPITAL		
18			COST RATE	RETURN	AFTER TAX	BEFORE TAX
19		1	2	3=1*2	4	
20	LONG TERM DEBT	47.00%	3.94%	1.8518%	1.1435%	1.8518%
21	EQUITY	53.00%	10.10%	5.3530%	5.3530%	8.6700%
22	TOTAL	100.00%		7.2048%	6.4965%	10.5218%
23						
24	Return on Equity		2.557%			
25						
26	Effective State and Federal Income Tax Rate		38.25%	5		
27						
28						
29						
30				Jan-Dec 2018		
31		Ratio	APPROVED	WEIGHTED COST OF CAPITAL		
32			COST RATE	RETURN	AFTER TAX	BEFORE TAX
33		1	2	3=1*2	4	
34	LONG TERM DEBT	47.00%	3.94%	1.8518%	1.3898%	1.8518%
35	EQUITY	53.00%	10.10%	5.3530%	5.3530%	7.1326%
36	TOTAL	100.00%		7.2048%	6.7428%	8.9844%
37						
38	Return on Equity		2.803%			
39						
40	Effective State and Federal Income Tax Rate		24.95%	5		

Estimate of Cost of Removal for Closure of Ash Ponds

Line	[3] 74.371%										9.917% (i)=9.9169% x (d)/(g)
	Decommissioning Amount for Closure of Ash Ponds (1)										
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = 74.371% x (d) / (g)	SC Annual Retail COR		
	Closure of Ash Ponds (2)	Project Indirects Adder (5%) (2)	Contingency (10%) (2)	Total	Estimated Retirement Date per Depr Study	Depr Study Implementation Date	Retail Recovery Period/Remaining Life per Depr Study (in years)	Retail COR for Ash Pond Closure			
2											
3											
4	\$ 22,000	\$ 1,100	\$ 2,200	\$ 25,300		July 1, 2012	10	\$ 1,882		251	
5	43,000	2,150	4,300	49,450		July 1, 2012	10	\$ 3,678		490	
6	11,000	550	1,100	12,650		July 1, 2012	10	\$ 941		125	
7	21,000	1,050	2,100	24,150		July 1, 2012	10	\$ 1,796		239	
8	7,000	350	700	8,050		July 1, 2012	10	\$ 599		80	
9	Subtotal Early-Retired Plants	5,200	10,400	119,600				\$ 8,895		1,186	
10	9,000	450	900	10,350	2033	July 1, 2012	21	\$ 367		49	
11	19,000	950	1,900	21,850	2035	July 1, 2012	23	\$ 707		94	
12	47,000	2,350	4,700	54,050	2035	July 1, 2012	23	\$ 1,748		233	
13	Subtotal active plants	3,750	7,500	86,250				\$ 2,821		376	
14	Total	\$ 8,950	\$ 17,900	\$ 205,850				\$ 11,716		1,562	

Notes

- (1) Amounts reflect 100% system amounts.
(2) Amounts per DEP Dismantlement Study
(3) Based on allocation factors from the last approved NC rate case

BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

DOCKET NO. 2018-318-E

In the Matter of :

Application of Duke Energy Progress, LLC

For Adjustments in Electric Rate Schedules and
Tariffs

) **DIRECT TESTIMONY OF**
) **DR. JULIUS A. WRIGHT**
) **FOR DUKE ENERGY**
) **PROGRESS, LLC**

I. INTRODUCTION AND PURPOSE

1 **Q. PLEASE STATE YOUR NAME, OCCUPATION, TITLE AND**
2 **BUSINESS ADDRESS.**

3 A. Julius A. Wright, Managing Partner, J. A. Wright & Associates, LLC, 18
4 Edgewater Drive, Cartersville GA, 30121. I am a consultant to regulated
5 utilities and regulatory agencies and other public bodies on issues related to
6 economics, economic modeling, regulatory policy, industry restructuring,
7 demand-side investments, and resource planning.

8 **Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS TESTIMONY?**

9 A. I am submitting this testimony on behalf of Duke Energy Progress, LLC (“DE
10 Progress,” or the “Company”).

11 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL**
12 **EXPERIENCE.**

13 A. I received an undergraduate degree from Valdosta State College (BS
14 Chemistry), an MBA in Finance from Georgia State University, and a
15 Master’s and Ph.D. in Economics from North Carolina State University,
16 where I focused on regulatory and environmental economics. Among other
17 past experiences, I served as a Commissioner on the North Carolina Utilities
18 Commission (“NCUC” or the “Commission”) from 1985 to 1993. Prior to
19 serving as a member of the Commission, I served three terms as a North
20 Carolina State Senator and worked in process engineering for 12 years at three
21 chemical plants, the last with Corning in Wilmington, NC.

1 Over the past 25 plus years in my consulting practice, I have dealt
2 extensively with electric and natural gas utilities focusing on a number of
3 issues. In this context, I have testified before regulatory commissions and
4 legislative bodies, presented studies and authored reports on issues related to
5 electric and gas regulation, and I have been a guest speaker at the Bonbright
6 Conference, other seminars, and at the Georgia Institute of Technology. I
7 have been a visiting professor teaching both microeconomics and
8 macroeconomics courses at the University of The Virgin Islands. I was also
9 one of three economists engaged by the California State Auditor to examine
10 the problems that led to that state's electric energy crisis in the summer and
11 fall of 2000. I have worked for the last 20 plus years in the field of electric
12 and gas regulation, primarily in the Southeast. A copy of my resume is
13 attached as Wright Exhibit 1.

14 **Q. PLEASE DISCUSS THE PURPOSE OF YOUR TESTIMONY.**

15 A. The purpose of my direct testimony is to support DE Progress' request to
16 recover costs incurred for coal ash disposal in response to new, more stringent
17 environmental regulations.

18 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

19 A. In the next section of my testimony, I provide a discussion of the general
20 regulatory principles dealing with the recovery of environmental costs
21 incurred by electric utilities in South Carolina. In Section III, I provide a brief
22 historical review of coal ash disposal regulations, how these regulations have
23 evolved over time, and how these evolving regulations have impacted the

1 Company. I conclude in Section IV by discussing why I believe DE Progress'
2 proposed coal ash related expenses in this filing should be recoverable as
3 recommended in the application and Company witnesses' testimony.

4 **II. BACKGROUND:**
5 **RECOVERY OF ENVIRONMENTAL COSTS**

6 **Q. WHAT ARE RECOVERABLE COSTS AS THEY RELATE TO**
7 **ELECTRIC UTILITY EXPENDITURES IN SOUTH CAROLINA?**

8 A. Recoverable costs include costs that are just and reasonable and used and
9 useful in the provision of adequate, safe, reliable, and reasonable electric
10 service to a utility's customers. Specifically, South Carolina Code of Laws at
11 § 58-27-810 declares the "rates shall be just and reasonable," and this standard
12 is repeated in § 58-27-850. With respect to the "used and useful" standard,
13 like other states South Carolina has defined used and useful utility property as
14 "property which it [the utility] necessarily devotes to rendering the regulated
15 services" and has allowed recovery for such property in rates. *Hamm v. S.C.*
16 *Pub. Serv. Comm'n*, 309 S.C. 282, 286 n. 1, 422 S.E.2d 110, 112 n. 1 (1992)
17 (quoting *Southern Bell Tel. & Tel. Co. v. Pub. Serv. Comm'n of S.C.*, 270 S.C.
18 590, at 600, 244 S.E.2d 278, at 283 (1978)).

19 The "used and useful" definition as it relates to rate base in South
20 Carolina was clarified in a Commission Order that stated "The rate base is
21 comprised of the value of the Company's property used and useful in
22 providing retail electric service to the public..." Order 87-1381, December 30,
23 1987, page 15.

24 With respect to the how retail electric service must be provided to

1 South Carolina ratepayers, the Commisison's Code of Regulations Section
2 103-301(2) states the purpose of the Code of Regulations is to *"to define good*
3 *practice...intended to insure adequate and reasonable service."* All of these
4 policies, along with safety and reliability, are further embodied in the Code of
5 Regulations in Sections 103-360 which states *"[t]he electric plant of an*
6 *electrical utility shall be constructed, installed, maintained and operated in*
7 *accordance with good engineering practice to assure, as far as reasonably*
8 *possible, continuity of service, uniformity in the quality of service, and the*
9 *safety of persons and property."*

10 As I discuss further herein, because environmental compliance costs
11 are a necessary used and useful cost of providing safe, reliable and adequate
12 electric service, then it follows that these types of costs – and a return on those
13 costs – are recoverable in rates.

14 **Q. ARE ENVIRONMENTAL COMPLIANCE COSTS A NECESSARY**
15 **EXPENDITURE SIMILAR TO OTHER COSTS A UTILITY MIGHT**
16 **SPEND IN PRODUCING AND DELIVERING POWER?**

17 A. Yes. In order to comply with environmental regulations the Company incurs
18 costs and these are similar to other costs necessary for the generation of
19 electric power. Thus as part of the operating expenses related to coal-fired
20 generating facilities, coal combustion residuals ("CCR") is produced in the
21 coal combustion process, and this ash has been collected in compliance with
22 environmental regulations at the time. These environmental expenses include
23 costs like scrubbers or coal ash facilities which can be rate base type expenses

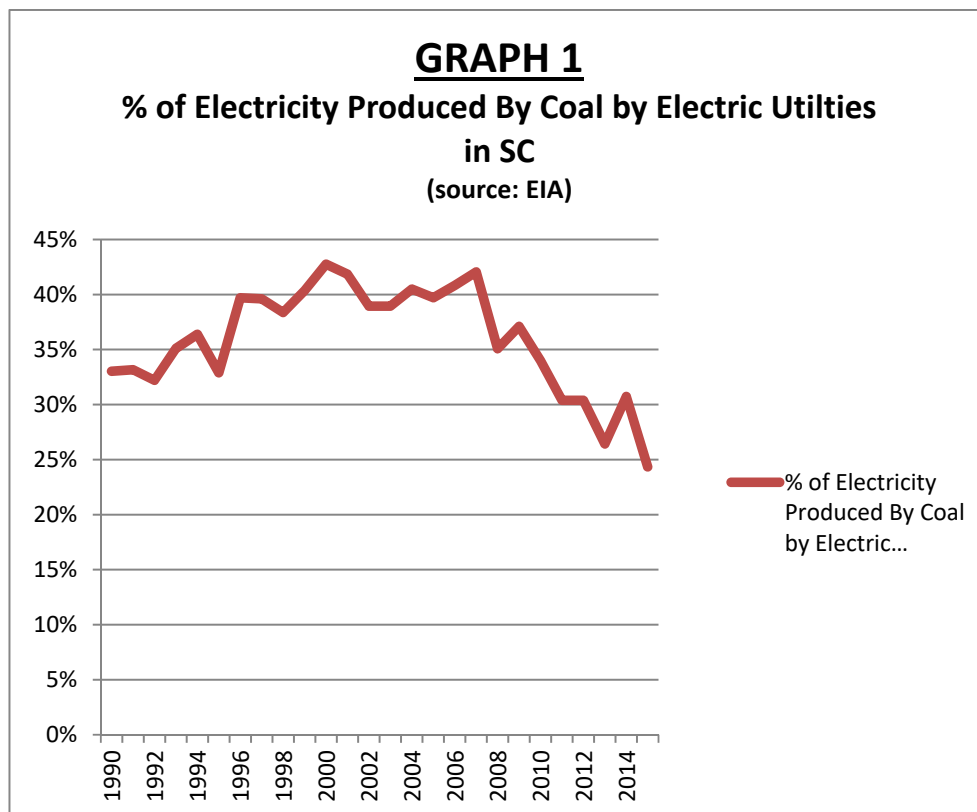
1 whose costs would be recovered over time. In addition, environmental costs
2 related to the treatment of pollutants, like ammonia and lime, or the cost of
3 emission allowance for SO₂, NO_x, mercury, and particulates, are all variable
4 environmental costs and are generally recoverable through the fuel adjustment
5 rider in South Carolina (§ 58-27-865). All of these environmental costs are
6 necessary for producing electricity in compliance with environmental
7 standards and, like nuclear decommissioning costs or coal plant retirement
8 costs, based on my experience and knowledge of fuel adjustment cost
9 recovery mechanisms in many states, these types of costs have long been
10 deemed recoverable from a utilities' ratepayers, including DE Progress in
11 South Carolina.

12 It should also be recognized that the coal plants associated with these
13 costs have been used and useful in providing low-cost, reliable power to South
14 Carolina customers for more than a century, and that is true regardless of
15 whether the generating plant is located in South Carolina or North Carolina –
16 all of the Company's generating units provide service on a systemwide basis
17 to both states. Consequently, these types of costs and, if any amount is
18 deferred over time, a return would be appropriately recoverable in rates to
19 ensure that the Company received the equivalent of the full amount of those
20 costs.

1 **Q. WHY HAVE YOU CONCLUDED THAT THESE COAL-FIRED**
2 **ELECTRIC GENERATING PLANTS HAVE BEEN USED AND**
3 **USEFUL IN THE PROVISION OF LOW-COST ELECTRIC SERVICE**
4 **TO CUSTOMERS IN SOUTH CAROLINA.**

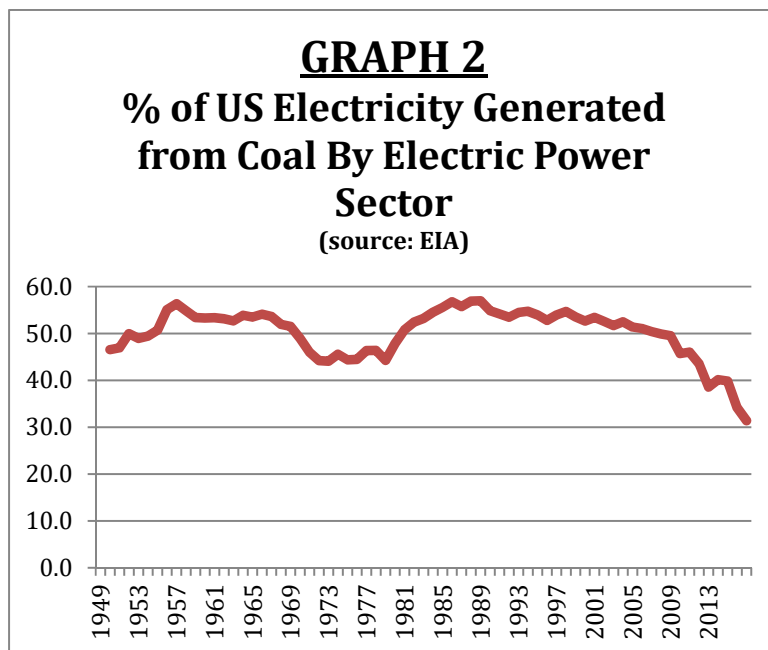
5 A. The Company's electric power generation from burning coal dates back to the
6 1920's. For example, the Cape Fear Plant in Moncure, North Carolina, began
7 commercial operation in 1923 with an ultimate generating capacity of 316
8 MW. Because power generation facilities are generally operated on a lowest
9 cost facility being used first, one can conclude that the Company's coal plants
10 have been used and useful in providing low-cost, reliable power to South
11 Carolina customers for more than a century. This conclusion is illustrated in
12 Graph 1 that illustrates that since 1990 (the earliest data available for the EIA)
13 usually more than 30% of the South Carolina's electric generation was
14 provided by coal-fired generation.¹ While more recently this dependence on
15 coal has diminished because of new environmental standards, coal-fired
16 generation continues to be an important component of DE Progress'
17 generation in South Carolina.

¹ This was the latest statewide data available from the EIA when the first draft of this testimony was developed. See State Historical Tables for 2015 (October 2016 as revised November 2016) (<https://www.eia.gov/electricity/data/state/>).



1 For a more historic perspective on the importance of coal to the
2 nation's electric industry, Graph 2 indicates that for the past seven decades
3 coal has provided the fuel to produce about 50% of the nation's electric
4 energy.² It should be noted that coal was chosen as a fuel source, both in
5 South Carolina and nationwide, primarily on the basis of economics, meaning
6 that at the time it was the least costly, reliable option to use as a generation
7 fuel resource. Because of this economic fact, but for the use of coal-fired
8 generation, historical electric prices in the State and nationwide would have
9 been higher.

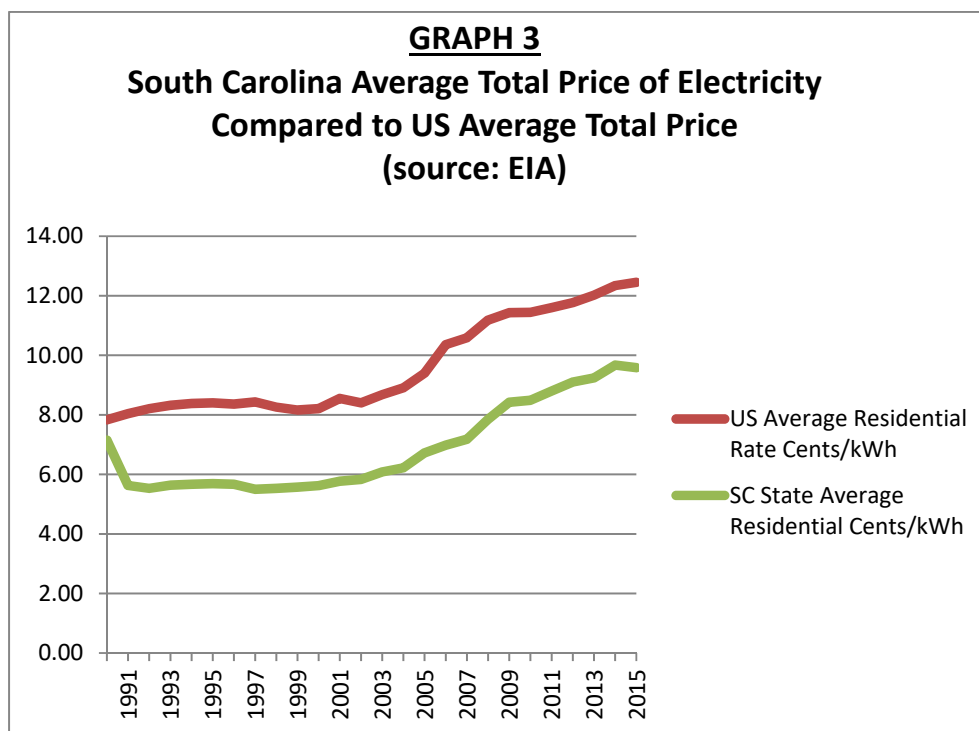
² This was the latest nationwide data available from the EIA. See April 2017 Monthly Energy Review, Table 7.2b Electricity Net Generation: Electric Power Sector (April 25, 2017) (<https://www.eia.gov/totalenergy/data/monthly/archive/00351704.pdf>).



1 In addition, the use of DE Progress' coal-fired generation has directly
2 benefitted the State's customers by virtue of the fact that South Carolina's
3 average retail electric rates have historically been below the national average.
4 This is shown in Graph 3 which provides a historical comparison of the
5 State's average electric price to the nation's. As this Graph 3 indicates, the
6 State's average electric prices have been below the national average since at
7 least 1990, which is the first year this state level data was available at the EIA.
8 These below national average electric rates have been an economic benefit to
9 South Carolina and its electric consumers.³ Because electric rates are
10 determined by the underlying cost to produce the electricity, and recognizing
11 that coal-fired plants were chosen and are dispatched primarily for economic
12 reasons, this simply means that the State's "below average" electric rates have

³ This was the latest statewide data available from the EIA. See
<https://www.eia.gov/totalenergy/data/annual/showtext.php?t=ptb0810>.

1 been achieved in large measure because of the State's use of its coal-fired
2 electric generation.



3 **Q. HAS THIS COMMISSION ALLOWED THE RECOVERY OF COSTS**
4 **RELATED TO ENVIRONMENTAL EXPENDITURES?**

5 A. Yes. I have already discussed how some environmental costs in South
6 Carolina, such as ammonia, lime and other reagents, are recovered through the
7 fuel adjustment rider (§ 58-27-865). Importantly, the recovery of other
8 environmental costs, such as scrubbers or ash basins, related to environmental
9 compliance would be consistent with the public policy of the South Carolina
10 which states it is “the public policy of the State to maintain reasonable
11 standards of purity of the air and water resources of the State, consistent with
12 the public health, safety and welfare of its citizens, maximum employment,

1 the industrial development of the State...” (at § 48-1-20).

2 Consequently, in order to comply with both the State’s public policy
3 goals and remain compliant with environmental standards, the Company has
4 made numerous investments over time in compliance with historical coal ash
5 and other environmental regulations, as discussed at length in the direct
6 testimony of Company Witness Kerin. It is my experience that these types of
7 costs, including the reasonable costs associated with operating, maintaining
8 and upgrading environmental equipment, plus a return, have been routinely
9 recovered as a cost of service through general rate cases, whether as capital or
10 ongoing operation and maintenance expense or some combination thereof.

11 In summary, when a utility invests in scrubbers to meet new and
12 heightened environmental standards, these costs have routinely been
13 recoverable. Similarly, when a utility invests dollars to meet new
14 environmental coal ash remediation standards, these costs should likewise be
15 recoverable. For example, in South Carolina the deferral balance of costs
16 associated with a Cliffside Unit 5 scrubber were amortized and in the rate base
17 (Settlement Agreement, Nov. 30, 2011, Docket No. 2011-271-E, Attachment
18 A, page 2). In addition, in Docket No. 2009-226-E costs associated with
19 scrubbers at the Allen Steam Station were amortized and in rate base
20 (Settlement Agreement, Nov. 24, 2009, Docket No. 2009-226-E, Attachment
21 A, page 2).

22 Where state specific requirements are indicated, those costs are often
23 shared between the two states consistent with the manner in which electrons

1 flow. In other words, shared costs for facilities that generate or have
2 generated electricity to both North and South Carolina are allocated between
3 the two states.

4 **Q. HAS THIS COMMISSION ADDRESSED THE RECOVERY OF NEW**
5 **COSTS ASSOCIATED WITH COAL ASH DISPOSAL ?**

6 A. Yes. In Docket No. 2016-227-E, DE Progress was allowed to recover coal
7 ash expense amortized over fifteen (15) years plus the Order's approved
8 return, albeit the Order did state that this finding had no precedential effect
9 and will not prejudice the position of any Party in any future proceeding
10 before the Commission.⁴ In this case, the Company is asking to be allowed to
11 recover coal ash expenses amortized over five years.

12 **Q. HOW ARE COSTS RECOVERED WHEN THE COSTS RELATE TO**
13 **FACILITIES IN TWO DIFFERENT STATES, LIKE WITH THE**
14 **ELECTRIC SYSTEM IN NORTH CAROLINA AND SOUTH**
15 **CAROLINA?**

16 A. Under this scenario, cost recovery depends on the type of cost. Some state
17 specific costs, unless directly assigned, are shared, or allocated, between both
18 states. In other words, shared costs for facilities that generate or have
19 generated electricity to both North and South Carolina are usually allocated
20 between the two states. These type of costs include a variety of things such as
21 workers compensation type costs, differences in everyday operating costs like
22 employees expenses, contractor expenses, fuel costs, and even costs like fuel

⁴ Order in Docket No. 2016-227-E, Dec. 21, 2016, page 11, paragraph 15.

1 transportation which can be different depending on the location of a
2 generating station (for example, rail service from coal mines to North Carolina
3 can be different, and usually cheaper because of distance, then rail service to
4 South Carolina). In addition, property taxes in South Carolina are higher than
5 property taxes in North Carolina, however these taxes for system assets like
6 generation plants are allocated to the whole system and not recovered on a
7 state specific basis.

8 **Q. HAVE NORTH CAROLINA AND SOUTH CAROLINA SHARED**
9 **ENVIRONMENTAL EXPENSES PRIOR TO THIS CASE?**

10 A. Yes. For example, the Cliffside and Allen generating stations scrubbers
11 mentioned above have been costs shared between the two states. This cost
12 sharing is common where a utility's operations span multiple states and the
13 utility property used to provide one particular state's electric service may be
14 located in another state. Also, the Company has entered into a Consent
15 Agreement with the South Carolina Department of Health and Environmental
16 Control (and a related Settlement Agreement with several environmental
17 groups) dealing with coal ash at the Robinson Plant, and the costs associated
18 with these South Carolina agreements are shared with North Carolina
19 ratepayers. Additional examples of states sharing environmental costs would
20 be the Southern Company utilities in Georgia, Alabama, Mississippi, and
21 Florida, and Entergy with electric utility services in Mississippi, Arkansas,
22 Louisiana, and Texas. In addition, coal ash disposal costs and beneficial reuse
23 revenues have to date been allocated and shared between both states.

1 **III. A BRIEF REVIEW OF THE HISTORY OF**
2 **COAL ASH DISPOSAL STANDARDS**

3 **Q. PLEASE DISCUSS SOME OF THE INITIAL COAL ASH DISPOSAL**
4 **STANDARDS.**

5 A. The Company's electric power generation from burning coal dates back to the
6 1920's. All of the Company's coal plants produced CCRs as fly ash and
7 bottom ash as direct by-products of the coal combustion process. In the
8 1950's the electric utility industry began to transport bottom ash by water
9 sluicing to constructed surface impoundments, which we commonly refer to
10 as ash basins. Over time, as discussed in more detail in the direct testimony of
11 Company Witness Kerin, the Company has consistently followed industry
12 standard practices in compliance with coal ash regulation.

13 **Q. DID THE COMMISSION ALLOW THE STATE'S ELECTRIC**
14 **UTILITIES TO RECOVER THE COSTS ASSOCIATED WITH THESE**
15 **EARLIER COAL ASH DISPOSAL REGULATIONS?**

16 A. Yes. As I mentioned earlier, these types of expenses have been routinely
17 recovered as a cost of service and included in rate cases including the
18 reasonable costs associated with operating, maintaining and upgrading
19 environmental equipment. The cost recovery for these rate-based
20 environmental costs also usually included a return. Also, as I mentioned
21 earlier, in Docket No. 2016-227-E, the Commission allowed DE Progress to
22 recover coal ash expense amortized over fifteen (15) years plus the Order's

1 approved return.⁵

2 **Q. HOW HAVE THE COAL ASH DISPOSAL STANDARDS CHANGED**
3 **OVER THE PAST DECADE?**

4 A. Coal ash use and disposal has been studied by the Environmental Protection
5 Agency ("EPA") since the mid-1980s. After several studies and some limited
6 regulatory standards, on May 22, 2000, the Environmental Protection Agency
7 ("EPA") determined the need to regulate coal combustion wastes that are
8 disposed in landfills and surface impoundments under Subtitle D (applicable
9 to non-hazardous waste) of the Resource Conservation and Recovery Act.

10 On December 22, 2008, a dike at a surface impoundment at Tennessee
11 Valley Authority's ("TVA") Kingston Fossil Plant in Harriman, Tennessee,
12 failed. In part as a response to this TVA accident, on June 21, 2010, the EPA
13 published in the Federal Register proposed new coal ash disposal regulations
14 for CCRs.⁶ The proposed regulations specifically referenced the TVA
15 incident as a major reason for the proposed rule.⁷ The EPA's proposed coal
16 ash disposal rule also discussed several other coal ash incidents that led to the
17 promulgation of the rule:

18 *"at the time of the May 2000 Regulatory Determination, the*
19 *Agency was aware of 14 cases of proven damages and 36 cases*
20 *of potential damages resulting from the disposal of CCRs. The*
21 *Agency has since learned of an additional 13 cases of proven*
22 *damages and 4 cases of potential damages, including a*
23 *catastrophic release of CCRs from a disposal unit at the*
24 *Tennessee Valley Authority (TVA) Kingston facility in*
25 *Harriman, Tennessee in December 2008. In total, EPA has*
26 *documented 27 cases of proven damages and 40 cases of*

⁵ Order in Docket No. 2016-227-E, Dec. 21, 2016, page 11, paragraph 15.

⁶ Federal Register/Vol. 75, No. 118/Monday, June 21, 2010/Proposed Rules, page 35128.

⁷ IBID, page 35132.

1 *potential damages resulting from the disposal of CCRs. Proven*
2 *damage cases have been documented in 12 states, and*
3 *potential damage cases—in 17 states.”⁸*

4 A more thorough discussion of these newer coal ash disposal regulations is
5 contained in the testimony of Company Witness Kerin.

6 **Q. DID THE ACCIDENTAL COAL ASH SPILL AT THE DUKE ENERGY**
7 **CAROLINAS’ DAN RIVER FACILITY IMPACT THE FINAL CCR**
8 **RULE?**

9 A. No. First, it is important to note that the EPA’s proposed rule’s publication
10 date precedes the February 2, 2014 coal ash release accident at the Dan River
11 Steam Station (“Dan River”), the Dan River accident was not mentioned in
12 the EPA’s proposed rule, nor could it have been, as a reason for establishing
13 the rule. Later, the finalized EPA rule, signed on December 19, 2014 and
14 published in the *Federal Register* (FR) on April 17, 2015 (the “CCR Rule”),⁹
15 did reference the Dan River accident, but it did not indicate that the accident
16 modified the proposed rule. Second, in promulgating the CCR Rule the EPA
17 cited hundreds of potential risks or incidents with ash ponds similar to Dan
18 River that led to the adoption of the Rule. Based on the citing of these
19 numerous incidents along with the timing of the CCR Rule, I would conclude
20 that the Dan River accident did not change the CCR regulations, although it
21 probably added support for the EPA’s proposals.

⁸ IBID, pages 35143, 35143.

⁹ See Federal Register/Vol. 80, No. 74/Friday, April 17, 2015/Rules and Regulations, page 21343; 21393-94.

1 **Q. HOW DID THE ACCIDENTAL COAL ASH SPILL AT THE**
2 **COMPANY’S DAN RIVER FACILITY IMPACT NORTH**
3 **CAROLINA’S CAMA LAW?**

4 A. Based on my review, it likely impacted the timing, but I cannot conclude that
5 it impacted the substance of the standards. There is no doubt that the Dan
6 River spill certainly helped prompt the North Carolina General Assembly to
7 examine the State’s and national coal ash disposal policies and regulations.
8 Out of that legislative investigation came North Carolina’s Coal Ash
9 Management Act (“CAMA”). However, some four years prior to the Dan
10 River accident, the EPA had already proposed and was close to finalizing its
11 new coal ash regulations. I feel confident the EPA’s proposed coal ash
12 regulations helped inform the State’s legislative leaders regarding the
13 language contained in CAMA for several reasons. First, having served in the
14 North Carolina General Assembly, I am sure that the legislative process
15 leading to CAMA included an investigation of, and used where appropriate,
16 the then current or proposed EPA coal ash standards. Second, there are many
17 similarities between the proposed EPA rule and CAMA. For example, both
18 discuss groundwater monitoring at length, both provide for the same two types
19 of coal ash pond closure methods, the definitions used in both are very similar
20 and sometimes use identical wording, and both contain three levels of
21 hazardous potential classifications associated with coal ash ponds.¹⁰

¹⁰ It should be noted that the risk levels identified in the EPA proposed rule were based on dam or dike structural integrity and the potential for loss of life or the level of economic harm. The levels of risk in CAMA considered structural integrity as one of several factors to consider and the risk was not strictly related to loss of life.

1 Finally, the proposed CCR regulation also strongly encouraged the
2 states to adopt at least the Federal minimum criteria in their solid waste
3 management plans.¹¹ Therefore, even without the Dan River accident in 2014
4 and the enactment of CAMA shortly thereafter, had CAMA not been enacted
5 in 2014, I believe that the State of North Carolina Legislature and/or the
6 State's Department of Environmental Quality may have taken steps to adopt
7 coal ash regulations similar to CAMA shortly after the CCR Rule was
8 finalized in 2015. Regardless, the Company must comply with both the
9 Federal and State coal ash disposal standards.

10 **Q. ARE THERE ANY SOUTH CAROLINA STATE SPECIFIC LAWS OR**
11 **GUIDELINES THAT THE COMPANY MUST FOLLOW IN ITS**
12 **DISPOSAL OF CCRS?**

13 A. Yes. For DE Progress in South Carolina there is one Consent Agreement with
14 DHEC applicable to ash management at the Robinson Plant. The Robinson
15 Consent Agreement, DHEC 15-23-HW, between Duke Energy Progress, Inc
16 (now DE Progress) and DHEC, requires ash excavation of a 1960 lay-of-land
17 ash storage area located south of the ash basin. This Consent Agreement also
18 includes provisions to initiate permitting of an on-site CCR lined landfill to
19 store the excavated ash.

20 Additionally, the South Carolina legislature passed H.B. 4857 in 2016,
21 which requires utilities to dispose of coal combustion residuals resulting from
22 the production of electricity to be placed in Class 3 landfills, except under

¹¹ Federal Register/Vol. 80, No. 74/Friday, April 17, 2015/Rules and Regulations, page 21430.

1 limited circumstances.

2 **Q. WHAT ARE THE SPECIFIC COAL ASH DISPOSAL STANDARDS**
3 **THAT DE PROGRESS MUST NOW MEET WITH RESPECT TO ITS**
4 **CURRENT COAL ASH DISPOSAL SITES?**

5 A. Company Witness Kerin discusses these standards in detail. In short, the
6 Company must comply with the 2015 Federal CCR Rule adopted by the EPA
7 which established national minimum criteria for active CCR landfills and
8 basins and inactive basins containing water, it must also comply with any
9 CAMA obligations (which are similar to the CCR Rule as discussed by
10 witness Kerin), and it must comply with the Robinson Consent Agreement as
11 well as two Settlement Agreements¹² between the Company and North
12 Carolina regulators and any other state agency requirements, such as those
13 that may be required by DHEC.

14 **IV. THE COMPANY'S PROPOSED COAL ASH COST**
15 **RECOVERY PROPOSAL IS REASONABLE**

16 **Q. WHAT ARE THE COSTS THE COMPANY IS SEEKING TO**
17 **RECOVER THAT YOUR TESTIMONY ADDRESSES?**

18 A. DE Progress has reasonably and prudently incurred and expects to incur a
19 total of \$526.4 million (on a system basis) related to incremental ash pond
20 closure compliance costs from July 2016 through December 2018.

¹² A Sept. 29, 2015 Settlement Agreement Between DE Progress and the North Carolina Department of Environmental Quality with regard to four generating facilities and an agreement between the Company and the same NC agency regarding the Asheville and H.F. Lee generating facilities.

1 **Q. THE COMPANY IS ALSO ASKING THE COMMISSION TO ALLOW**
2 **THE COMPANY TO DEFER COAL ASH RELATED EXPENSES**
3 **PENDING RECOVERY ADJUDICATION IN A FUTURE RATE**
4 **CASE. IS THIS A COMMON PRACTICE UNDER SOUTH**
5 **CAROLINA REGULATORY PROCEDURES?**

6 A. Yes. A deferred account mechanism is not unusual in ratemaking. In his
7 book discussing utility regulation Goodman indicates that “The use of
8 deferred cost accounting in the ratemaking context is so common and so
9 fundamental a regulatory tool that no agency is likely to consider it necessary
10 to study whether as a matter of policy costs should be deferred...”¹³ In
11 Docket No. 2015-96-E (Order No. 2015-308) this Commission allowed the
12 Company to defer costs associated with coal ash related environmental
13 remediation costs. DE Carolinas also has a currently effective deferral
14 approved in the Commission’s Order in Docket No. 2016-196-E, dated July
15 13, 2016. DE Progress has a similar deferral that is ongoing, which was
16 approved in the Order in Docket No. 2016-227-E, dated December 21, 2016.

17 **Q. IS IT REASONABLE TO EXPECT CUSTOMERS TO PAY FOR THE**
18 **DISPOSAL OF COAL ASH?**

19 A. Yes. Those dollars are required to be spent in compliance with new coal ash
20 disposal requirements. Such a circumstance is not new in the history of
21 environmental regulations in the United States, where it is commonplace for
22 restrictions to be modified and become more restrictive over time. For

¹³ Goodman, Leonard, “The Process of Ratemaking,” Public Utility Reports, Vienna, Va, 1998, p. 322.

1 example, in our day-to-day life we have all experienced ever-tightening
2 environmental restrictions on the automobiles we drive, as the emissions
3 standards have grown increasingly stringent and more costly over the past few
4 decades and the related costs have increased the costs of driving.

5 So, too, have electric utility generating plants been the focus of ever-
6 tightening and more costly environmental standards. As an example, consider
7 the evolution of coal gas smokestack emission standards, which are generally
8 related to the federal Clean Air Act (“CAA”) and its various updates or
9 amendments.¹⁴ The enactment of the CAA of 1970 resulted in a major shift in
10 the federal government's role in air pollution control by authorizing the
11 development of comprehensive federal and state regulations to limit
12 emissions. The EPA was created on December 2, 1970, in large measure to
13 implement the various requirements of the CAA.¹⁵ Major revisions and
14 stricter clean air standards were adopted as updates to the CAA in 1977 and
15 1990 and these new standards impacted coal-fired generating plants.¹⁶

16 Following the CAA 1990 amendments, the EPA devised a strategy to
17 further reduce NOx emissions from coal-fired power plants by imposing
18 tighter NOx emissions standards. In addition, in 1998, the EPA issued a rule
19 that required 21 states (including North Carolina and South Carolina) to
20 further reduce NOx emissions through the use of newer, cleaner control

¹⁴ While sometimes the standards did not specifically target older coal-fired generating plants, invariably the more stringent standards would either impact a utility's total emissions limits, or a state's, consequently impacting even those older facilities that were not specifically targeted by newer emissions regulations.

¹⁵ See: <https://www.epa.gov/sites/production/files/2015-08/documents/peg.pdf>.

¹⁶ See: <https://www.epa.gov/clean-air-act-overview/clean-air-act-requirements-and-history>.

1 strategies.¹⁷.

2 Consequently, the history of environmental regulation is replete with
3 examples of ever-tightening environmental regulations with the result being,
4 with respect to utilities, the associated costs for meeting these ever-tightening
5 environmental regulations usually becoming the responsibility of customers.
6 Likewise, the issue of ever-tightening environmental regulations with respect
7 to coal ash standards is the genesis of the Company's request as it relates to
8 these new and additional coal ash disposal costs.

9 **Q. ARE CERTAIN COAL ASH COSTS NOT RELATED TO**
10 **COMPLIANCE WITH THE CCR RULE OR CAMA ALSO**
11 **RECOVERABLE FROM CUSTOMERS?**

12 A. Yes. As I mentioned earlier, DE Progress in South Carolina entered into a
13 Consent Agreement with DHEC applicable to ash management at the
14 Robinson Plant which requires ash excavation of a 1960 lay-of-land ash
15 storage area located south of the ash basin. This Consent Agreement also
16 includes provisions to initiate permitting of an on-site CCR lined landfill to
17 store the excavated ash. Additionally, the Company entered into a Settlement
18 Agreement with the South Carolina Office of Regulatory Staff and other
19 parties related to the recovery of certain coal ash remediation costs, and this
20 settlement was approved by this Commission in the aforementioned Order in
21 Docket No. 2016-227-E, dated Dec. 21, 2016, page 11, paragraph 15. All of
22 the costs related to the Robinson Plant Consent Agreement and costs related to

¹⁷ See: <http://instituteforenergyresearch.org/studies/the-facts-about-air-quality-and-coal-fired-power-plants/>.

1 the aforementioned Settlement Agreement must all be recovered, or in the
2 latter case, continue to be recovered, even if these costs may be above those
3 necessary to comply with the CCR Rule or CAMA.

4 **Q. ARE THERE ANY COSTS RELATED TO CAMA THAT ARE IN**
5 **EXCESS OF THE FEDERAL CCR RULE'S COSTS THAT ARE**
6 **BEING REQUESTED IN THIS FILING?**

7 A. This is discussed in Company Witness Kerin's testimony. As he discusses,
8 there are some CAMA costs that are considered a system cost whose recovery
9 is being requested, but there are other North Carolina resident-specific costs
10 related to CAMA and not required by the CCR that the Company is not
11 seeking to recover from South Carolina customers.

12 **Q. DOES THE FACT THAT NEW STANDARDS WERE ADOPTED**
13 **MEAN THAT DE PROGRESS' PAST PRACTICES WERE**
14 **UNREASONABLE?**

15 A. No. It is well established that the standard for determining the prudence of a
16 utility's actions should be whether management decisions were made in a
17 reasonable manner and at an appropriate time on the basis of what was
18 reasonably known or reasonably should have been known at that time. To that
19 end, a basic public utility regulatory principle is that a decision's prudence
20 "must be based on a contemporaneous view of the action or decision under
21 question. Perfection is not required. Hindsight analysis – the judging of

1 events based on subsequent developments — is not permitted.”¹⁸ In short, the
2 Company’s decisions related to coal ash disposal must be judged in
3 accordance with the regulatory standards and industry practice as it existed at
4 the time the decisions were made based on the fact that this was the
5 information available to the Company at that time.

6 With respect to this prudence evaluation criteria, as discussed in the
7 direct testimony of Company Witness Kerin, the Company historically has
8 complied with all coal ash disposal regulations and used industry standard
9 disposal operations for all its coal ash handling operations. Today, the coal
10 ash disposal standards have simply changed and been updated as has occurred
11 with many environmental standards over time. In the past, the Company was
12 required to meet the coal ash disposal standards at the time, and so too it must
13 now comply with the new coal ash disposal standards.

14 **Q. IN YOUR OPINION ARE THE COAL ASH DISPOSAL COSTS THAT**
15 **DE PROGRESS IS SEEKING TO RECOVER IN THIS CASE “USED**
16 **AND USEFUL” UTILITY COST?**

17 A. Yes. DE Progress’s coal ash disposal sites have always been used and useful
18 as part of the coal-fired generation production process. As I discussed earlier
19 the Company’s coal fired generating plants, whether located in South Carolina
20 or North Carolina, have been used and useful and provided electric service
21 that produced economic benefits to customers in South Carolina for decades.

22 In addition, as referenced in the direct testimony of Company Witness Kerin,

¹⁸ Phillips, Charles F., The Regulation of Public Utilities, Public Utilities Reports, Arlington, VA.,1993, p. 340.

1 the Company has historically spent dollars in order to comply with the coal
2 ash disposal regulations in effect at the time, and these dollars were a
3 necessary expenditure related to used and useful utility costs made in the
4 provision of electric service at the time. The Company was, and continues to
5 be, obligated to meet the needs of its customers. This obligation to serve
6 requires the disposal of coal ash subject to the disposal standards at the time,
7 thereby rendering the disposal sites for this coal ash, for which costs DE
8 Progress seeks recovery in this case, “used and useful” in providing electric
9 service. In addition, it should be noted that these same costs were just found
10 to be “used and useful” in three different proceedings in North Carolina
11 including the Company’s proceeding last year where the North Carolina
12 Commission specifically stated that these type of costs were “used and useful
13 in the provision of service to the Company’s customers (Order, Docket E-2,
14 Sub 1131, page 18).

15 **Q. HAS THE COMMISSION ALREADY ADDRESSED THE RECOVERY**
16 **OF THESE SPECIFIC TYPE OF COAL ASH DISPOSAL COSTS**
17 **WITH ANOTHER ELECTRIC UTILITY?**

18 A. Yes. As I mentioned, in Docket No. 2016-227-E, DE Progress was allowed to
19 recover these same coal ash expenses, albeit the Order did state that this
20 finding had no precedential effect and will not prejudice the position of any
21 Party in any future proceeding before the Commission.¹⁹

¹⁹ Order in Docket No. 2016-227-E, Dec. 21, 2016, page 11, paragraph 15.

1 **Q. ARE THERE EXAMPLES OF UTILITY INFRASTRUCTURE**
2 **PROJECTS THAT DEALT WITH AN ENVIRONMENTAL ISSUE**
3 **AND COST RECOVERY THAT IS SIMILAR IN NATURE TO THE**
4 **COAL ASH ISSUE IN THIS FILING?**

5 A. I believe a similar situation that is instructive are the ongoing costs related to
6 gas pipeline safety and integrity. Like coal ash regulations, these pipeline
7 safety and integrity regulations have changed and become more costly over
8 the past few years. For example, in 2011 the DOT and Pipeline and
9 Hazardous Materials Safety Administration (“PHMSA”), promulgated
10 regulations that require inspection, repair, rehabilitation and/or replacement of
11 the highest risk natural gas pipeline infrastructure by pipeline operators. The
12 program included an inventory of pipelines by type, system evaluation to
13 identify risks and an implementation plan to mitigate those risks. South
14 Carolina natural gas systems have had expenditures to comply with these new
15 regulations and South Carolina Electric & Gas Company has been allowed to
16 collect these costs through a deferral mechanism, including a return, and
17 collect these costs over time (Docket. No. 2014-461-G, see filings dated Dec.
18 3, 2014, ORS filing dated Dec. 10, 2014, and Commission Directive dated
19 Dec. 17, 2014).

20 **Q. ARE THERE OTHER EXAMPLES OF ENVIRONMENTAL COST**
21 **RECOVERY SIMILAR TO THE COST RECOVERY OF COAL ASH**
22 **DISPOSAL?**

23 A. Yes. As I mentioned earlier in this testimony, in this Commission’s Docket

1 No. 2011-271-E, costs associated with a Cliffside scrubber were amortized
2 and in the rate base. In addition, in Docket No. 2009-226-E costs associated
3 with scrubbers at the Allen Steam Station were amortized and in rate base.

4 **Q. ARE THERE POTENTIAL COST SHARING LIABILITIES RELATED**
5 **TO THESE COAL ASH DISPOSAL COSTS THAT MIGHT**
6 **MATERIALIZE AND THUS DIMINISH THE OVERALL COST**
7 **IMPACTS ON CUSTOMERS?**

8 A. Yes. The Company has filed insurance litigation. When and if those monies
9 materialize, customers should see the benefit of those proceeds, like spent fuel
10 litigation. However, these cases can take many years to finally resolve. It
11 would be appropriate for the Commission to monitor these cases and ensure
12 that any outcome benefits customers. It is my understanding that the
13 Company has no objection to that approach.

14 **Q. ARE THERE WAYS THAT THE COMPANY MIGHT SUGGEST**
15 **THAT THE COMMISSION COULD ADOPT AS A MEANS OF**
16 **MITIGATING THE OVERALL RATE IMPACT FROM THESE NEW**
17 **ADDITIONAL COSTS?**

18 A. Yes. For example, it is not unusual for such costs to be stretched out over a
19 number of years so that the impact on rates is more manageable. If that type
20 of option is adopted, however, then it is appropriate for the utility to receive
21 carrying costs to ensure it is made whole for all costs.

1 **Q. BECAUSE ONLY PRUDENTLY INCURRED COSTS ARE**
2 **RECOVERABLE, HAVE YOU EXAMINED WHETHER THE**
3 **ACTUAL DOLLARS BEING REQUESTED BY THE COMPANY ARE**
4 **REASONABLE AND PRUDENT?**

5 A. I have examined the filing, many of the Federal and State laws related to coal
6 ash disposal, the testimony of Company Witness Kerin and other Company
7 witnesses, reviewed past Commission Orders regarding environmental cost
8 recovery, discussed with the Company its history related to coal ash disposal,
9 and reviewed the more recent settlement agreements related to coal ash
10 disposal. Based on my review, I believe that the Company is in the best
11 position to address coal ash disposal and the related costs in conformance with
12 State and Federal coal ash disposal requirements and I believe their actions in
13 this regard are prudent.

14 **Q. DO YOU BELIEVE THE COMPANY'S COAL ASH COST**
15 **RECOVERY PROPOSAL IS REASONABLE?**

16 A. Yes. I believe that the Company's proposals to recover its costs for
17 complying with updated coal ash disposal regulations are reasonable and
18 consistent with the historical regulatory treatment of similar costs.

19 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY**
20 **AT THIS TIME?**

21 A. Yes.

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Dr. Julius A. "Chip" Wright
J. A. Wright & Associates, LLC

Julius A. "Chip" Wright is the President of J. A. Wright and Associates, LLC
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Experience Overview

Prior to starting his firm, Dr. Wright was a Client Partner for AT&T Solutions Utilities and Energy Practice and before that a Principal in EDS' Management Consulting Services. Dr. Wright has been consulting electric gas, and telephone utilities on regulation, economics, rates, production modeling and strategic planning for the past three years. Prior to this Dr. Wright served an eight-year term as a Utility Commissioner for the state of North Carolina. Prior to that he served three terms in the North Carolina State Senate while he was a senior project engineer for Corning Glass Works on their optical wave guide project in Wilmington, North Carolina. He has a total of 14 years' government-related experience, 12 years' plant-related engineering experience, and he has established two companies.

Dr. Wright (in 2011) has also been a Visiting Professor at the University of the Virgin Islands teaching sophomore courses in both Macro and Micro Economics.

While serving on the North Carolina Utility Commission, he served four years on the National Association of Regulatory Utility Commissioners (NARUC) Electricity Committee. He

has served in various other advisory capacities, including the Keystone

Committee on Externalities; the North Carolina Radiation Protection Committee, and on an Oversight Committee for a joint North Carolina/New York/ Department of Energy (DOE) project.

Dr. Wright has also served on the Southern States Energy Board Task Force on Restructuring the Electric Utility Industry.

Regulatory Policy Issues, Prudence Reviews and Regulatory Studies

- Presented testimony and rebuttal testimony to the North Carolina Utility Commission in support of Duke Energy Carolinas' efforts to recovery coal ash remediation costs the Company incurred in response to new coal ash disposal costs, Feb., 2017, Docket No. E-7, Sub 1146.
- Presented testimony and rebuttal testimony to the North Carolina Utility Commission in support of Duke Energy Progress' efforts to recovery coal ash remediation costs the Company incurred in response to new coal ash disposal costs, June and November, 2017, Docket No. E-2, Sub 1146.
- Prudence review: report for Georgia Power Company regarding the prudence of Plant Vogtle new nuclear construction costs, *"The South Carolina Public Service Commission's Prudence Reviews of Summer Units 2 and 3 as Persuasive*

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Precedent for the Georgia Public Service Commission's Regulatory Treatment of Vogtle Units 3 and 4," April 5, 2016, Georgia Public Service Commission, Docket No 29849.

- Regulatory study: *"The Economic and Rate Implications from an Electric Utility's Loss of Large Load Customers,"* presented in rebuttal testimony for Progress Energy Carolinas, North Carolina Utility Commission Docket No. E-2, Sub 1023, March 4, 2013.
- Regulatory study: Dr. Wright routinely provides testimony support and witness training to several Fortune 500 investor-owned utilities in the Southeast, most recently involving two rate cases (2011, 2012) and three rate related cases dealing with an ongoing nuclear construction project (2008, 2010, 2012).
- Prudence review: related to a review of affiliate cost structure relative to compliance with FERC Order 707, conducted for a major SE utility, 4th quarter, 2008.
- Prudence review: related to a review of Affiliate Cost for Service Company Charges to a Regulated Utility, study conducted for SCANA Corporation, May, 2008.
- Regulatory study: review of Electric Utility Formula Rate Plans and specific Entergy formula rate plans, conducted for Entergy Mississippi, Jan-May, 2008.
- Prudence review: June 2005, provided a financial analysis related to the options for collecting and saving nuclear plant decommissioning costs for Duke Energy and this study along with a presentation was provided to the North Carolina Public Utility Commission and Staff.
- Regulatory study: provided analysis for Entergy Mississippi that was presented to the Mississippi Public Service Commission related to the valuation of services that Company provided to an unregulated affiliate, November 2002.
- Prudence review: *"Energy Deregulation,"* March 2001, report of the California State Auditor on the causes of the problems related to high electric prices and blackouts (from May, 2000 through June 2001, and ongoing) in California's restructured electric marketplace. Dr. Wright was one of three consultants who essentially researched and prepared the State Auditor's report.
- Prudence review: Principal author with Dr. Al Danielsen of *"Reliability of Electric Supply In Georgia,"* published by The Bonbright Utilities Center,

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University of Georgia, June, 2001.

- Regulatory study: Presented testimony before the North Carolina Public Utilities Commission on behalf of SCANA Corporation regarding issues related to market power in its merger with Public Service Company of North Carolina, Docket No. G-5, Sub 400; G-3, Sub 0.
- Prudence review: was the principal author of a report and investigation titled "*An Analysis of Commonwealth Edison's Planning Process For Achieving Reliability of Supply*," which was an investigation of the Company's planning process to meet its statutory obligation for supplying electricity as Illinois transitions to a competitive retail electric market, Illinois Commerce Commission Docket No. 98-0514.
- Regulatory study: co-authored a national study that used computer modeling techniques to quantify the impact of electric competition on the aggregate economy in each of the 48 continental United States.
- Regulatory study: presented testimony to Louisiana Legislative Committee on behalf of Entergy Corporation regarding the various regulatory and technical issues that need to be addressed in the transition to competition.
- Regulatory study: presented testimony For Virginia Power with regard to its transition to competition plan.
- Regulatory study: testified before the Mississippi Public Service Commission on issues related to the establishment of retail electric competition, including ISO establishment, regional power exchanges, legislation, taxes and regulatory policies.
- Regulatory study: presented testimony for Entergy Corp. in both Louisiana and Arkansas in support of its transition to competition filing.
- Regulatory study: worked with three major southeastern utilities on developing business and regulatory strategy as they prepare for competition.
- Regulatory study: filed a report with the South Carolina Legislature that studied the impact of electric competition on the state of South Carolina.
- Was a panelist on a Southern Gas Association national televised forum on performance based regulation for the natural gas industry.
- Regulatory study: Was the lead policy witness for South Carolina Electric and Gas on obtaining regulatory approval to transfer of depreciation reserve from a nuclear plant to T&D

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depreciation reserve. This is a critical issue in preparing for competition and limiting stranded investment.

- Developed regulatory and marketing strategy for Entergy with regard to its telecommunications initiatives. In these efforts he worked with the EDS Telecommunications Consulting Group.
- Prudence review: was the lead analysis of the prudence of Central Vermont Public Service Company's power and resource acquisitions over a five year period. The prudence of this utility's power supply strategy was under investigation in a rate case proceeding. Dr. Wright's team filed testimony supporting the Company and their efforts were instrumental in undermining the charges of imprudence brought by the Company's opposition.
- Regulatory study: developed an EDS intra-company task force to address the issues related to FERC's Transmission NOPR. This task force subsequently filed three responses to FERC's Open Access NOPR which provide a basis for EDS to maintain a leadership position as the electric utility industry undergoes restructuring to a competitive market.
- Regulatory study: helped develop a regulatory strategy and presented testimony on behalf of

South Carolina Pipeline. In this case, an economic analysis prepared by Dr. Wright and Dr. Frank Cronin (from EDS Economic Planning and Analysis Consulting Group) was presented along with recommendations. The analysis and recommendations were generally accepted by the Commission staff.

- Prudence reviews: as a North Carolina Utility Commissioner Dr. Wright was involved in the prudence reviews of the costs related to the construction of three nuclear plants, Catawba 1 & 2 and Shearon Harris. In addition, he was involved in several other prudence reviews of various utilities.

Resource Planning & Economic Analysis

As a Commissioner he has been involved in a variety of resource planning issues including chairing the last North Carolina Resource Planning hearing that involved Duke Power Company, Carolina Power and Light, Virginia Power Company and the North Carolina Electric Membership Corporation.

He was also selected by the states of North Carolina and New York and the Department of Energy to be one of five representatives on a peer review panel overseeing a Resource Planning project being conducted by the Oak Ridge National Laboratories. In addition to these initiatives Dr. Wright has:

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- *“The Economic and Rate Implications from an Electric Utility’s Loss of Large Load Customers,”* presented in rebuttal testimony for Progress Energy Carolinas, North Carolina Utility Commission Docket No. E-2, Sub 1023, March 4, 2013.
- Provided an analysis of electric vehicle economics and the legislative, engineering, and regulatory issues that regulated electric utilities should address in both residential and commercial installments of electric vehicle charging stations. Studied performed for Fortune 500 Southeastern investor-owned utilities, 2011-2012.
- Provided a study to a Fortune 500 large Southeastern investor-owned utility related to the use of regulated electric rates designed to help retain current large industrial customers, 2012.
- Provided a Fortune 500 large Southeastern based investor-owned electric utility an economic, engineering, and environmental evaluation of a proposed renewable fuel alternative including the provision of an assessment and the design for a large-scale pilot test in one of that utility’s fossil-fired facilities, 2012.
- Provided testimony for Entergy Mississippi related to whether the Mississippi Public Service Commission should adopt some proposed Federal standards related to integrated resource planning and energy efficiency, Docket No. 2008-AD-477, February 2009.
- Provided a report to Entergy Mississippi on fuel cost recovery mechanisms that included a nationwide survey of fuel adjustment mechanisms, 2008.
- Provided testimony in North Carolina for Duke Energy related to whether the North Carolina Public Utility Commission should approve the recovery of nuclear generation project development costs, Docket No. E-7-Sub 819, April 2008.
- Provided a review for Duke Energy of the cost assumptions and regulatory initiatives related to new nuclear plant construction nationwide, April 2008.
- Provided analysis for Entergy Mississippi related to new nuclear plant applications and any new regulatory mechanisms adopted by various states related to the approval or cost recovery associated with these new nuclear plants, April 2008.
- Presented testimony on behalf of Entergy Mississippi on its IRP or electric resource plan and demand side initiatives, June, 2008, Docket No. 2008-AD-158.
- Provided testimony in Georgia for Georgia Power Company supporting that Company's Integrated Resource Planning

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process, the appropriate methods for evaluating demand side energy options, and supporting that Company's planned demand side programs, Docket No. 24505-U, June 2007.

- Provided testimony in North Carolina for Duke Energy and Progress Energy related to the regulatory and economic rationale and appropriateness for using the "peaker" methodology and other methodologies for the establishment of avoided cost rates, Docket No. E-100-Sub 106, June 2007.
- Provided analysis for Entergy Mississippi that was presented to the Mississippi Public Service Commission related to the valuation of services that Company provided to an unregulated affiliate, November 2002.
- Was the lead policy witness for South Carolina Electric and Gas on obtaining regulatory approval to transfer depreciation reserve from a nuclear plant to T&D depreciation reserve. This is a critical issue in preparing for competition and limiting stranded investment.
- Was instrumental in acquiring a large engagement for a major southeastern utility examining their competitive position as it relates to a competitive electric market. During the engagement he provided input and guidance on regulatory issues related to the

deregulation of the electric industry.

- Assisted Carolina Power and Light Company in their integrated resource planning process by advising and facilitating a Commission directed public policy panel.
- Developed an overview of Niagara Mohawk Gas' integrated resource planning efforts. This engagement was under a contract from Oak Ridge National Laboratories.

Renewable Fuels, Demand Side, Energy Efficiency

- Provided an analysis of electric vehicle economics and the legislative, engineering, and regulatory issues that regulated electric utilities should address in both residential and commercial installments of electric vehicle charging stations. Studied performed for Fortune 500 Southeastern investor-owned utilities, 2011-2012.
- Provided a Fortune 500 large Southeastern based investor-owned electric utility an economic, engineering, and environmental evaluation of a proposed renewable fuel alternative including the provision of an assessment and the design for a large-scale pilot test in one of that utility's fossil-fired facilities, 2012.

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- Provided testimony for Entergy Mississippi related to that Company's proposed new demand side initiatives Docket No. EC-123-0082-00, February 2009.
 - Provided testimony for Entergy Mississippi related to whether the Mississippi Public Service Commission should adopt some proposed Federal standards related to integrated resource planning and energy efficiency, Docket No. 2008-AD-477, February 2009.
 - Presented testimony on behalf of Public Service of North Carolina supporting that Company's proposed demand side initiatives as well as the cost recovery of those initiatives, Docket No. G-5, Sub 495, March 2008.
 - Provided testimony in South Carolina for Duke Energy, South Carolina Electric and Gas, and Progress Energy related to whether the South Carolina Public Service Commission should adopt some proposed Federal standards related to smart metering and energy efficiency rate setting procedures, Docket No. 2005-386-E, April, 2007.
 - Provided testimony in South Carolina for South Carolina Electric and Gas related to Integrated Resource Planning and that Company's demand side initiatives, June 2007.
 - Provided testimony in Georgia for Georgia Power Company supporting that Company's Integrated Resource Planning process, the appropriate methods for evaluating demand side energy options, and supporting that Company's planned demand side programs, Docket No. 24505-U, June 2007.
 - Provided testimony in North Carolina for Duke Energy and Progress Energy related to whether the North Carolina Public Utility Commission should adopt some proposed Federal standards related to smart metering, energy efficiency, and electric resource planning, Docket No. E-100-Sub 108, November 2006.
- Nuclear Issues***
- Prudence review: report for Georgia Power Company regarding the prudence of Plant Vogtle new nuclear construction costs, *"The South Carolina Public Service Commission's Prudence Reviews of Summer Units 2 and 3 as Persuasive Precedent for the Georgia Public Service Commission's Regulatory Treatment of Vogtle Units 3 and 4,"* April 5, 2016, Georgia Public Service Commission, Docket No 29849.
 - Dr. Wright provided testimony support and witness training involving three rate related cases dealing with an ongoing nuclear

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construction project (2008, 2010, 2012).

- Provided testimony in North Carolina for Duke Energy related to whether the North Carolina Public Utility Commission should approve the recovery of nuclear generation project development costs, Docket No. E-7-Sub 819, April 2008.
- August 2008 provided a study to Duke Energy Carolinas examining the issue of cost justification for new nuclear power facilities.
- June, 2005, provided a financial analysis related to the options for collecting and saving nuclear plant decommissioning costs for Duke Energy and this study along with a presentation was provided to the North Carolina Public Utility Commission and Staff.

Cost of Service, Rate Design, Forecasting

While serving more than eight years on the North Carolina Commission, Dr. Wright was involved in several cost of service and rate design analyses, testimonies, and orders. This included work in electric, telephone, gas, and water utilities. Additionally, he has presented testimony on performance based ratemaking and he has been involved in analyzing electric utility forecasting models, including end-use models, regression analysis (both linear and nonlinear) and customer discrete choice modeling forecasts. Furthermore, Dr. Wright's Ph.D. is in environmental

and regulatory economics with special research into nonlinear minimal cost optimization procedures for electric utility production models. This work included optimizing investments, optimal regulatory regimes, pricing, cost recovery, and rate of return issues.

In addition, he has:

- *"The Economic and Rate Implications from AN Electric Utility's Loss of Large Load Customers,"* presented in rebuttal testimony for Progress Energy Carolinas, North Carolina Utility Commission Docket No. E-2, Sub 1023, March 4, 2013.
- Provided a study to a Fortune 500 large Southeastern investor-owned utility related to the use of regulated electric rates designed to help retain current large industrial customers, 2012.
- Presented testimony on behalf of Public Service of North Carolina related to the establishment of a formulary type rate setting mechanism for this natural gas LDC, August 2008, Docket No. G-5, Sub 495.
- Provided testimony in Georgia for Georgia Power Company supporting that Company's methodology for pricing fuel and its use of marginal replacement fuel cost procedures in its intra-company resource sharing arrangement with the Southern company, Docket No. 191142-U, April 2005.

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- Provided an economic analysis of the proper regulatory regime for South Carolina Pipeline Company. In this analysis he presented testimony supporting performance based ratemaking and his recommendations were generally accepted by the Commission staff.
- Developed forecasted rates for two New York state utilities. These rates were developed to support a bond filing by a co-generator.
- Provided a forecast of power payments from New York State Electric and Gas (NYSEG) to two independent power producers (IPPs). This forecast was used to estimate the level of overpayments by NYSEG to these IPPs, under PURPA regulations, which he used in a filing before FERC supporting the company's claim of unlawful overpayments.

Telecommunications

As a Commissioner he has regulated all types of telecommunications providers for eight years. In addition, he has worked with two electric utilities in strategy formulation in regard to their entering the telecommunications business. Furthermore, he has eight years experience as a fiber optic engineer.

Other Areas of Expertise

Prior to joining EDS, he worked for eight years as a senior process engineer for Corning Glass in the design and

production of optical waveguides (or fiber optics). Prior to that he worked for four years in the chemical industry as a process chemist and later as a senior project engineer. He has done work in environmental monitoring, process and product improvement, plant utilization, as well as starting and selling two successful companies – one in the financial leasing business and the other in the entertainment industry.

Presentations and Publications

Report for Georgia Power Company regarding the prudence of Plant Vogtle new nuclear construction costs, *"The South Carolina Public Service Commission's Prudence Reviews of Summer Units 2 and 3 as Persuasive Precedent for the Georgia Public Service Commission's Regulatory Treatment of Vogtle Units 3 and 4,"* April 5, 2016, Georgia Public Service Commission, Docket No 29849.

"The Economic and Rate Implications from AN Electric Utility's Loss of Large Load Customers," presented in rebuttal testimony for Progress Energy Carolinas, North Carolina Utility Commission Docket No. E-2, Sub 1023, March 4, 2013.

"Energy Deregulation," March 2001, report of the California State Auditor on the causes of the problems related to high electric prices and blackouts (from May, 2000 through June 2001, and ongoing) in California's restructured electric marketplace. Dr. Wright was one of three consultants who essentially researched and prepared the State Auditor's report.

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“Low Cost States and Electric Restructuring - The Issue is the Price!” presented to the 1999 Miller Forum on Government, Business and the Economy, University of Southern California, April 19, 1999.

An Analysis of Commonwealth Edison's Planning Process For Achieving Reliability of Supply, Illinois Commerce Commission Docket No. 98-0514.

The Impact of Competition on the Price of Electricity, author, published by L. A. Wright and Associates, November, 1998.

“Retail Competition in the Electric Industry: The Impact on Prices,” presented at the 18th Annual Bonbright Center Energy Conference, Atlanta, Georgia, Sept. 10, 1998.

Potential Economic Impacts of Restructuring the Electric Utility Industry, co-author, published by the Small Business Survival Committee, Washington, DC, November, 1997.

“How Deregulation Will Affect Power Quality and Energy Management,” presented at the Power Quality and Energy Management Conference co-sponsored by Entergy and EPRI, New Orleans, LA, Nov. 14, 1997.

“Deregulation of the Electric Industry,” *Proceedings: National Business Energy Forum*, June 26, 1997, New Orleans, LA.

“A Different View of the Market,” presented at the Southeastern Electric Exchange Conference, June 25, 1997, Charlotte, N.C.

“Restructuring The Electric Utility Industry: Theory vs. Reality,” presented at the American Bar Association Restructuring Conference, Raleigh, NC, Dec. 5, 1996.

“Restructuring: The Best Approach for Virginia,” presented at the Virginia State Corporation Commission Electricity Restructuring Forum, Charlottesville, VA, Nov. 15, 1996.

“Alternative Rate Making for the Natural Gas Industry: State Issues,” presented at the Tenth Annual NARUC Biennial Regulatory Information Conference, Columbus, Ohio, Sept. 12, 1996.

“RetailCo: To Regulate or Not?” presented at the 9th Annual Automatic Meter Reading Symposium, New Orleans, La., Sept. 10, 1996.

“Convergence: The Competitive Revolution Comes To Electric Power,” presented to the Southeastern Association of Regulatory Commissioners Annual Convention, Point clear, Alabama, June 4, 1996.

“Stranded Assets Recovery Issues,” presented at the Western Electric Power Institute: Financial Forum, Tucson, Arizona, March 8, 1996.

“The Deregulation of the Electric Utility Industry : Current Status,” presented at the North Carolina Economic Developers Association Midwinter Conference, Pinehurst, N.C., February 23, 1996.

“Performance Based Regulation for The Natural Gas Industry,” panelist on Southern Gas Association's Televised

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Regulatory Forum, Dallas, Texas, Jan. 18, 1996.

“Industry Structure Should Meet Stakeholder Objectives,” *Electric Light and Power*, Jan., 1996.

“Quantifying the Value of Stranded Investment: A Dynamic Modeling Approach,” *Proceedings: Implementing Transmission Access and Power Transactions Conference*, Denver, Colorado, Dec. 14, 1995.

“Quantifying the Value of Stranded Investment: A Dynamic Modeling Approach,” at the 15th Annual Bonbright Center Electric and Natural Gas Conference, October 9-11, 1995, Atlanta, Georgia.

Comments to FERC in the matter of Notice of Proposed Rulemaking on Open Access, Docket No. 95-9-000, 1995.

“The Road to Competition for Re-Regulated Industries,” presented at the 1995 PROMOD users Forum, St. Petersburg, Florida, May 1, 1995.

“*Comparing New York State Electric and Gas Corporation’s Non-Utility Generator Payments to Current Avoided Cost Rates*,” report submitted in support of affidavit filed before FERC in Docket No. EL 95-28-000.

“A Solution To The Transmission Pricing and Stranded Investment Problems” *Public Utilities Fortnightly*, January 1995.

“Electric Utility Competition: The Winning Focus,” presented at 1994 Southeastern Electric and Natural Gas

Conference, Atlanta, Georgia, October 1994.

“*Gas Integrated Resource Planning: The Niagara Mohawk Experience*,” for Martin Marietta Energy Systems, Inc., under contract to the United States Department of Energy, ORNL/SUB/93-03369.

“Future Regulation In the Water Industry - Can We Solve the Problems Before They Happen?” *Water*, Vol. 29, No. 2, pp. 14-17, Summer 1988.

“The Regulatory Process - Historical and Today,” presented at Carolina Power and Light Company’s IRP Public Participation Committee Seminar, June 1994.

“The Regulatory Role In DSM: Who Pays?” presented at Carolina Power and Light Company’s IRP Public Participation Committee Seminar, June 1994.

“The Regulatory Process In North Carolina,” North Carolina Telephone Association, June 1991.

Testimony

- Presented testimony and rebuttal testimony to the North Carolina Utility Commission in support of Duke Energy Carolinas’ efforts to recovery coal ash remediation costs the Company incurred in response to new coal ash disposal

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costs, Feb., 2017, Docket No. E-7, Sub 1146.

- Presented testimony and rebuttal testimony to the North Carolina Utility Commission in support of Duke Energy Progress' efforts to recovery coal ash remediation costs the Company incurred in response to new coal ash disposal costs, June and November, 2017, Docket No. E-2, Sub 1146.
- Presented testimony before the Mississippi Public Service Commission on behalf of Entergy Mississippi, Inc., in support of that company's revisions to its Formula Ratemaking procedures, Docket No. 2014-UN-132, June 2014.
- Rebuttal testimony for Progress Energy Carolinas, related to the economic and rate implications from an electric utility's loss of large load customers, North Carolina Utility Commission Docket No. E-2, Sub 1023, March 4, 2013.
- Provided a study to a Fortune 500 large Southeastern investor-owned utility related to the use of regulated electric rates designed to help retain current large industrial customers, and developed proposed testimony in support of this issue, 2012.
- Provided an affidavit in support of Progress Energy Carolinas to the North Carolina Utility Commission in a proceeding considering the appropriate avoided cost rates that should be paid to an independent power producer, Sept., 2010, Docket No. E-2, Sub 966.
- Presented testimony on behalf of Entergy Mississippi in an investigation of the Commissions procedures concerning confidentiality, August, 2010, Docket No. 2010-AD-259.
- Presented testimony before the Mississippi Public Service Commission on behalf of Entergy Mississippi, Inc., in support of the formula rate plan annual evaluation, Docket No. 2002-UN-526, March, 2009.
- Presented testimony before the Mississippi Public Service Commission on behalf of Entergy Mississippi, Inc., in support of an energy efficiency pilot program and cost recovery mechanism, Docket No. 2009-UN-064, February, 2009.
- Presented testimony before the Mississippi Public Service Commission on behalf of Entergy Mississippi, Inc., in a proceeding to review statewide energy generation needs, Docket 2008-AD-270, August 2008.
- Presented testimony on behalf of Public Service of North Carolina related to the establishment of a formulary type rate setting mechanism for this natural gas LDC, August, 2008, Docket No. G-5, Sub 495.

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- Presented testimony on behalf of Entergy Mississippi in an investigation of that utility's fuel charges and its fuel cost recovery, July, 2008, Docket No. 2008-AD-270.
 - Presented testimony on behalf of Entergy Mississippi on its IRP or electric resource plan and demand side initiatives, June, 2008, Docket No. 2008-Ad-158.
 - Presented testimony for Duke Energy in North Carolina related to the approval to incur pre-construction costs for the proposed Lee Nuclear Station, Docket No. E-7, Sub 819, May, 2008.
 - Presented testimony for Duke Energy in South Carolina related to the approval to incur pre-construction costs for the proposed Lee Nuclear Station, Docket No. 2007 -440-E, June, 2008.
 - Presented rebuttal testimony for Duke Energy in North Carolina related to the recovery of costs incurred by Duke related to GridSouth and why these expenses should be fully recoverable at this time, Docket No. E-7, Sub 828, October, 2007.
 - Provided testimony for Georgia Power in its 2007 Integrated Resource Plan reviewing the plan filed by the Company and discussing how its demand-side proposals were reasonable,
- compared the Company's demand-side proposals to those found in neighboring states, and discussed the application of the various tests used to evaluate demand-side programs (TRC, RIM, PTC), Docket number 24505-U, May, 2007.
- Presented two testimonies before the South Carolina Public Service Commission on behalf of South Carolina Electric and Gas, Duke Energy and Progress Energy Carolinas in the investigation of adoption of energy efficiency and generation standards related to the Energy Policy Act of 2005, Dockets No. 2005-385-E and No. 2005-386-E, April, 2007.
 - Presented testimony before the North Carolina Public Utilities Commission on behalf of Duke Energy and Progress Energy Carolinas in the investigation of adoption of energy efficiency and generation standards related to the Energy Policy Act of 2005, Docket No. E-100, Sub 108 November 2006.
 - Presented testimony before the North Carolina Public Utilities Commission on behalf of Duke Energy in the investigation of Duke Energy's 2006 Integrated Resource Plan, Docket No. E-100, Sub 103, June, 2006.
 - Provided testimony for Georgia Power in its 2005 Fuel Adjustment Hearing on the issue of the appropriate pricing

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methodology for the dispatch and sale of electricity in the Southern Company system, Docket number 19142-U, April, 2005.

- Presented testimony on behalf of South Carolina Electric and Gas Company before the South Carolina Public Utility Commission for South Carolina Pipeline Company related to the inclusion of a generating plant in rate base and to the recovery of RTO (Gridsouth) related costs, Docket No. 2004-178-E, October, 2004.
 - Presented testimony on behalf of Entergy Mississippi before the Mississippi civil court dealing with maintaining the confidentiality of special use contracts, August, 2004.
 - Presented rebuttal testimony before the South Carolina Public Utility Commission for South Carolina Pipeline Company related to the reasons for continuing a program that allows flexible, competitive based pricing for large, interruptible customers that have alternative fuels, Docket No. 2004-6-G, May 29, 2004.
 - Presented testimony before the Georgia Public Service Commission on the appropriate range for a return on equity earnings band (a form of performance based regulation) to set in a Savannah Electric & Power Company rate case,
- Docket No. 14618-U, April, 2002.
- Presented testimony before the Georgia Public Service Commission on behalf of Scana Energy Marketing related to affiliate relationships and the appropriate affiliate rules between Atlanta Gas Light Company's regulated and unregulated affiliates. Docket No. 146060-U, August 24, 2001.
 - Presented testimony before the Georgia Public Service Commission on the appropriate range for a return on equity earnings band (a form of performance based regulation) to set in a Georgia Power Company rate case, Docket No. 14000-U, November 19, 2001.
 - Presented testimony before the North Carolina Public Utilities Commission on behalf of SCANA Corporation regarding issues related to market power the appropriate affiliate relationship protections necessary in its merger with Public Service Company of North Carolina, Docket No. G-5, Sub 400; G-3, Sub 0.
 - Presented testimony before the South Carolina Public Service Commission on behalf of South Carolina Pipeline Corporation regarding issues related to its annual review of gas costs as reflected in its purchase gas adjustment charge, Docket No. 1999-007-G, September, 1999.

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- Presented testimony before the Arkansas Public Service Commission on behalf of Entergy Arkansas, Inc. regarding regulatory policies related to the definition of public utilities as it impacts citing requirements of non-utility owned generating facilities, Dockets No. 98-337-U, March 9, 1999.
- Presented Rebuttal and Surrebuttal testimony before the Louisiana Public Service Commission on behalf of Entergy Louisiana, Inc. and Entergy Gulf States regarding regulatory policies related to stranded cost recovery and on the issue of whether investors have been compensated for the risk of not recovering stranded costs, Dockets Nos. U-22092SC and U-20925, September, 1998.
- Presented testimony to the South Carolina Public Utility Commission for South Carolina Pipeline Corp. related to acquisition adjustments and regulatory policies related to performance based regulation, Docket No. 90-588-G, June, 1998.
- Testified before the Mississippi Public Service Commission on issues related to the establishment of retail electric competition, including ISO establishment, regional power exchanges, legislation, taxes and regulatory policies, April 16, 17, 1997.
- Support of Transition Proposals filed by Virginia Power Corporation, March, 1997.
- Entergy Arkansas testimony in support of Transition to Competition Filing, 1997.
- Entergy Louisiana testimony in support of Transition to Competition Filing, 1997.
- Support of Performance Based Regulation for GTE South Inc., Docket No. P-19, Sub 277, before the North Carolina Utility Commission, filed Nov. 22, 1995.
- Stranded Cost Regulatory Policy and Recovery Testimony before the South Carolina Public Service Commission, the Commission approved the request Dr. Wright was advocating, Docket No. 95-1000-E, October 27, 1995.
- Performance based rate making mechanism and rate levels, testimony on behalf of South Carolina Pipeline Corporation, Docket No. 90-588-G, filed August 3, 1995.
- Prudence Review of Power Resource Planning for Central Vermont Public Service Company, Docket No. 5724, September 7, 1994.
- Rebuttal testimony on behalf of Central Vermont Public Service Company, Docket 5724, September 7, 1994.

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- Surrebuttal testimony on behalf of Central Vermont Public Service Company, Docket No. 5724, September 9, 1994.

Education

Dr. Wright received a Ph.D. in Economics from North Carolina State University, focusing on regulatory and environmental economics, and is a member of the honor society.

He received an MBA in finance from Georgia State University in 1978, graduating with honors.

He received a Master of Economics from North Carolina State University in 1991 and was a member of the honor society.

He received a B.S. in Chemistry from Valdosta State College in Valdosta, Georgia, graduating Magna Cum Laud.

In addition, he has completed the Michigan State University Regulatory Course, several other NARUC courses on regulation, been an instructor on regulatory issues at several NARUC courses, completed management courses at Corning Glass and financial seminars at Bank Boston and Merrill Lynch dealing with regulation.

Dr. Wright (in 2011) has also been a Visiting Professor at the University of the Virgin Islands teaching sophomore courses in both Macro and Micro Economics.

Sum of Monetary Amount 2		Accounting Period CMD											
Project ID CB	Project Short Descr CB	1	2	3	4	5	6	7	8	9	10	11	12 Grand Total
20057343	01RX0CRP4 BA CON&NON SCRUB WW					5,917,294.84	84,861.60	48,422.19	100,105.90	70,784.62	27,489.21	27,782.95	91,254,451.87
20055627	01RX2CRP4 FLYASH RELIABILITY												120,531.50
20055628	01RX3CRP4 FLYASH RELIABILITY												708,086.73
20055629	01RX4CRP4 FLYASH RELIABILITY	5,887.34	3,766.00	169.70	9,154.13	95.65	92.37	5,595.29	96.01	105.32	91.74	(449.36)	9,522,216.49
CCASH137	CCP ASH-137 Potable Water Line Repl			416,823.22	4,391.16	2,856.74	2,249.01		2,018.29	0.99			621.90
CCMAY162	CCP MAY-149,-152 MFMV, P & VFD Inst												428,339.41
CHFL129C	CCP HFL-129 Pond Dam Spilly Install		2,020,997.56	1,415.45								807,443.80	807,654.64
CRX000213	RX00 - Lined Retention Basin												210.84
Grand Total		5,887.34	2,024,763.56	418,408.37	13,545.29	5,920,247.23	87,202.98	54,017.48	102,220.20	70,890.93	27,580.95	9,648,907.15	22,853,630.47
													114,937,533.31
													133,311,204.79

GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2013

FILED SENATE
May 14, 2014
S.B. 729
PRINCIPAL CLERK

S

D

SENATE DRS25122-TAa-16 (05/07)

Short Title: Governor's Coal Ash Action Plan.

(Public)

Sponsors: Senators Apodaca and Berger (Primary Sponsors).

Referred to:

1 A BILL TO BE ENTITLED
2 AN ACT TO (1) CHANGE NOTIFICATION REQUIREMENTS APPLICABLE TO
3 DISCHARGES OF WASTEWATER; (2) ESTABLISH COAL COMBUSTION
4 PRODUCTS IMPOUNDMENT WATER MONITORING PROGRAM; (3) IDENTIFY
5 AND ADDRESS UNPERMITTED WASTEWATER DISCHARGES AT COAL
6 COMBUSTION PRODUCTS IMPOUNDMENT SITES; (4) AMEND S.L. 2009-390; (5)
7 REQUIRE EMERGENCY ACTION PLANS FOR HIGH AND INTERMEDIATE
8 HAZARD DAMS; (6) CHANGE NOTIFICATION REQUIREMENTS APPLICABLE TO
9 DAM REPAIRS; (7) INCREASE COAL COMBUSTION PRODUCTS IMPOUNDMENT
10 INSPECTION REQUIREMENTS; (8) MODIFY THE DEFINITION OF SOLID WASTE
11 TO INCLUDE REMOVED COMBUSTION PRODUCTS; (9) PLACE A TEMPORARY
12 MORATORIUM ON THE USE OF COAL COMBUSTION PRODUCTS AS
13 STRUCTURAL FILL; AND (10) ESTABLISH REQUIREMENTS FOR COAL
14 COMBUSTION PRODUCTS IMPOUNDMENT CLOSURE.

15 Whereas, the issue of coal ash storage has not been adequately addressed in North
16 Carolina for more than six decades; and

17 Whereas, on February 2, 2014, an estimated 39,000 tons of coal ash was released
18 into the Dan River following the failure of a stormwater pipe under a utility coal ash
19 impoundment pond in Eden, North Carolina; and

20 Whereas, the Department of Environment and Natural Resources ("Department")
21 finds that coal combustion products have settled into the sediment of the river bottom and
22 will require an extensive clean-up plan to complete remediation; and

23 Whereas, the Department is in the process of reassessing previous efforts at
24 achieving compliance at coal ash facilities and developing short term and long term policies
25 in light of the Dan River spill, violations discovered in light of increased inspections of coal
26 combustion products disposal facilities and anticipated new federal regulations on coal
27 combustion products; and

28 Whereas, it is the intent of the Department to ensure that spills of wastewater are
29 reported to the Department in a defined and adequate time frame; and

30 Whereas, it is the intent of the Department to protect surface water and groundwater
31 resources for their best usage; and

32 Whereas, it is the intent of the Department to ensure that all unpermitted
33 wastewater discharges are eliminated or addressed in an environmentally responsible manner;
34 and



* D R S 2 5 1 2 2 - T A A - 1 6 *

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Whereas, it is the intent of the Department to equally subject all dams under jurisdiction of G.S. 143-215.23 to the requirements of statute and administrative code; and

Whereas, it is the intent of the Department for the owners of all dams under jurisdiction of G.S. 143-215.23 deemed intermediate and high hazard by the Department to prepare at their own cost documents that describe full and adequate response to emergency situations at their dams and to submit those documents to the Department; and

Whereas, it is the intent of the Department to ensure that emergency situations at dams are reported to the Department in a defined and adequate time frame; and

Whereas, it is the intent of the Department to increase oversight of dam structure integrity to protect the health and safety of the public; and

Whereas, state law exempts coal combustion products removed from impoundments from being defined as a solid waste; and

Whereas, the Department finds that consistent environmental standards should apply to coal combustion products removed from impoundments for management or disposal and coal combustion products managed or disposed of as a solid waste; and

Whereas, the Department finds the federal Environmental Protection Agency is under consent decree to complete new regulations by December 2014 for coal combustion products that are proposed to bring consistency to requirements for large fills such as structural fills and landfills; and

Whereas, the Department finds that conversion and closure of coal ash storage ponds is necessary for protection of the health and safety of the public; Now, therefore, The General Assembly of North Carolina enacts:

PART I. NOTIFICATION REQUIREMENTS APPLICABLE TO DISCHARGES OF WASTEWATER

SECTION 1. G.S. 143-215.1C reads as rewritten:

"§ 143-215.1C. Report to wastewater system customers on system performance; report discharge of untreated wastewater and wastewater containing coal combustion products to the Department; publication of notice of discharge of untreated wastewater and waste.

(a) Report to Wastewater System Customers. – The owner or operator of any wastewater collection or treatment works, the operation of which is primarily to collect or treat municipal or domestic wastewater and for which a permit is issued under this Part and having an average annual flow greater than 200,000 gallons per day, shall provide to the users or customers of the collection system or treatment works and to the Department an annual report that summarizes the performance of the collection system or treatment works and the extent to which the collection system or treatment works has violated the permit or federal or State laws, regulations, or rules related to the protection of water quality. The report shall be prepared on either a calendar or fiscal year basis and shall be provided no later than 60 days after the end of the calendar or fiscal year.

(a1) Report of Discharge of Untreated Wastewater or Wastewater Containing Coal Combustion Products to the Department. – The owner or operator of any wastewater collection or treatment works shall report a discharge of 1,000 gallons or more of untreated wastewater or wastewater containing coal combustion products, or a spill of any amount of untreated wastewater or wastewater containing coal combustion products that reaches waters of the State to the Department as soon as possible but not later than 24 hours after first knowledge of the spill. This reporting requirement shall be in addition to any other reporting requirement applicable to the owner or operator of the wastewater collection or treatment works.

(b) Publication of Notice of Discharge of Untreated Wastewater. – The owner or operator of any wastewater collection or treatment works, the operation of which is primarily to

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collect or treat municipal or domestic wastewater ~~and for which a permit is issued under this Part~~ shall:

- (1) In the event of a discharge of 1,000 gallons or more of untreated wastewater or wastewater containing coal combustion products to the surface waters of the State, issue a press release to all print and electronic news media that provide general coverage in the county where the discharge occurred setting out the details of the discharge. The owner or operator shall issue the press release within 48-24 hours after the owner or operator has ~~determined that the discharge has reached the surface waters of the State~~ first knowledge of the spill. The owner or operator shall retain a copy of the press release and a list of the news media to which it was distributed for at least one year after the discharge and shall provide a copy of the press release and the list of the news media to which it was distributed to any person upon request.
 - (2) In the event of a discharge of 15,000 gallons or more of untreated wastewater to the surface waters of the State, publish a notice of the discharge in a newspaper having general circulation in the county in which the discharge occurs and the county immediately downstream and in each county downstream from the point of discharge that is significantly affected by the discharge. The Secretary shall determine, at the Secretary's sole discretion, which counties are significantly affected by the discharge and shall approve the form and content of the notice and the newspapers in which the notice is to be published. The notice shall be captioned "NOTICE OF DISCHARGE OF UNTREATED SEWAGE". The owner or operator shall publish the notice within 10 days after the Secretary has determined the counties that are significantly affected by the discharge and approved the form and content of the notice and the newspapers in which the notice is to be published. The owner or operator shall file a copy of the notice and proof of publication with the Department within 30 days after the notice is published. Publication of a notice of discharge under this subdivision is in addition to the requirement to issue a press release under subdivision (1) of this subsection.
- (c) Publication of Notice of Discharge of Untreated Waste as defined in G.S. 143-213(18). – The owner or operator of any wastewater collection or treatment works, other than a wastewater collection or treatment works the operation of which is primarily to collect or treat municipal or domestic ~~wastewater, for which a permit is issued under this Part~~ wastewater shall:
- (1) In the event of a discharge of 1,000 gallons or more of untreated waste to the surface waters of the State, issue a press release to all print and electronic news media that provide general coverage in the county where the discharge occurred setting out the details of the discharge. The owner or operator shall issue the press release within 48-24 hours after the owner or operator has ~~determined that the discharge has reached the surface waters of the State~~ first knowledge of the spill. The owner or operator shall retain a copy of the press release and a list of the news media to which it was distributed for at least one year after the discharge and shall provide a copy of the press release and the list of the news media to which it was distributed to any person upon request.
 - (2) In the event of a discharge of 15,000 gallons or more of untreated waste to the surface waters of the State, publish a notice of the discharge in a newspaper having general circulation in the county in which the discharge occurs and the county immediately downstream and in each county

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downstream from the point of discharge that is significantly affected by the discharge. The Secretary shall determine, at the Secretary's sole discretion, which counties are significantly affected by the discharge and shall approve the form and content of the notice and the newspapers in which the notice is to be published. The notice shall be captioned "NOTICE OF DISCHARGE OF UNTREATED WASTE". The owner or operator shall publish the notice within 10 days after the Secretary has determined the counties that are significantly affected by the discharge and approved the form and content of the notice and the newspapers in which the notice is to be published. The owner or operator shall file a copy of the notice and proof of publication with the Department within 30 days after the notice is published. Publication of a notice of discharge under this subdivision is in addition to the requirement to issue a press release under subdivision (1) of this subsection."

PART II. COAL COMBUSTION PRODUCTS IMPOUNDMENT WATER MONITORING PROGRAM

SECTION 2. Article 21 of Chapter 143 of the General Statutes is amended by adding a new section to read:

"§ 143-215.1D. Coal combustion products impoundment water monitoring program.

(a) Groundwater Assessment – Owners of coal ash impoundments located at all investor-owned public utilities shall conduct groundwater monitoring according to the following schedule and procedures:

(1) No later than 45 days from enactment of this Act, the owner shall submit to the Division of Water Resources a Plan of proposed assessment activities to evaluate groundwater impacts from all coal combustions products impoundments located at all investor owned public utilities. At a minimum the plan shall:

- a. Identify all receptors and significant exposure pathways.
- b. Assess horizontal and vertical extent of soil and groundwater contamination for all contaminants confirmed to be present in groundwater in exceedance of groundwater quality standards and all significant factors affecting contaminant transport.
- c. Identify the geological and hydrogeological features influencing the movement, chemical, and physical character of the contaminants.
- d. Propose a schedule for continued groundwater monitoring.

Upon review and approval by the Division of Water Resources, the investor-owned public utility shall initiate assessment activities.

(2) No later than 180 days from the Division of Water Resources' written approval of the Plan required under subdivision (1) of subsection (a) of this section, or a time frame otherwise approved by the Division of Water Resources, the owner shall submit a Report detailing the findings of the Plan. The Report shall set forth the extent of any and all exceedances of the groundwater quality standards.

(3) No later than 270 days from the Division of Water Resources' written approval of the Plan required under subdivision (1) of subsection (a) of this section, or a time frame otherwise approved by the Division of Water Resources, the owner shall submit to the Division of Water Resources a proposed Corrective Action Plan. The Corrective Action Plan shall, at a minimum, contain:

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- 1 a. A listing of all exceedances of the groundwater quality standards
2 including any exceedances that the owner asserts are the result of
3 natural background conditions.
4 b. Except as provided in subdivision f. of this subdivision, a
5 description of the proposed corrective action employing the best
6 available technology for the restoration of groundwater quality to the
7 level of the groundwater quality standards and reasons for its
8 selection.
9 c. Specific plans, including engineering details where applicable, for
10 restoring groundwater quality.
11 d. A schedule for the implementation of the proposed corrective action
12 plan.
13 e. A monitoring plan for evaluating the effectiveness of the proposed
14 corrective action and the movement of the contaminant plume.
15 f. The owner may request alternative remediation as provided for under
16 the requirements of 15A NCAC 2L .0106 (k), (l), or (m).
17 (4) No later than 30 days from the Division of Water Resources' approval of a
18 Final Corrective Action Plan, the owner shall implement the Final
19 Corrective Action Plan in accordance with a schedule established by
20 Division of Water Resources. The approval of a Final Corrective Action
21 Plan is not a final agency action pursuant to G.S. 150B.
22 (b) Drinking Water Assessment. – Within 60 days of enactment of this Act, owners of
23 coal ash impoundments located at all investor-owned public utilities shall conduct and submit
24 to the Division of Water Resources a water supply receptor survey. The Survey shall identify
25 all receptors within a radius of 2,640 feet (0.5 mile) from the established compliance boundary
26 of each impoundment. The owner shall sample each receptor identified by the Division of
27 Water Resources. For any well exceeding the groundwater standards, the owner shall replace
28 the water supply with a supply of potable drinking water.
29 (c) Annual Reporting Requirement. – In addition to any other reports required by the
30 Division of Water Resources, the owners of coal combustion products impoundments located at
31 all investor owned public utilities shall submit an annual report to the Division of Water
32 Resources no later than January 31 of each year. The Annual report shall include a summary of
33 all monitoring data collected over the year, status of Plans and Final Corrective Action Plans,
34 and a summary of water supply receptor survey results."

35
36 **PART III. IDENTIFY AND ADDRESS UNPERMITTED WASTEWATER**
37 **DISCHARGES AT COAL COMBUSTION PRODUCTS IMPOUNDMENT SITES**

38 **SECTION 3.** Article 21 of Chapter 143 of the General Statutes is amended by
39 adding a new section to read:

40 **"§ 143-215.1E. Identify and address unpermitted wastewater discharges at coal**
41 **combustion products impoundment sites.**

42 (a) Owners of coal combustion products impoundments located at all investor-owned
43 public utilities shall implement the plan described in subsections (b) through (h) of this section
44 to identify and address any unpermitted discharges to surface waters at those coal combustion
45 products impoundment sites.

46 (b) No later than 90 days from enactment of this act, the owner shall submit a
47 topographic map at a scale approved by Division of Water Resources that indicates the
48 locations of all outfalls from engineered channels designed and/or improved for the purpose of
49 collecting water from the toe of the coal combustion products impoundments. For each outfall,
50 the map will:

51 (1) Specify its latitude and longitude.

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(2) Specify whether the discharge is continuous or intermittent.

(3) Provide an average flow measurement, including a description of the method used to measure flow.

With the topographic map, the owner will submit to the Division of Water Resources a schedule according to which the owner shall conduct water quality sampling of the toe drain outfalls in order to further characterize the discharging water. No later than 30 days from receipt of the map and sampling schedule, Division of Water Resources will provide the owner with review comments, either approving the plan or noting any deficiencies to be corrected and a date by which a corrected map and/or sampling schedule is to be submitted for further review and comment. Within 30 days of approval of the schedule by the Division of Water Resources, the owner shall begin to sample the toe drain outfalls in accordance with the schedule and submit the samples for water quality analysis. Water quality analyses shall include the same parameters required for a coal-fired power plant per EPA Application Form 2C – Wastewater Discharge Information, Consolidated Permits Program (EPA Form 3510-2C, August 1990). If the owner demonstrates to the satisfaction of Division of Water Resources that sampling of a toe drain outfall is unlikely to generate usable data or is otherwise infeasible, the owner will not be required to sample that toe drain outfall.

(c) No later than 180 days from the enactment of this act, the owner shall submit a topographic map at a scale approved by the Division of Water Resources that indicates the locations of any seeps or drains reflecting discharges from the ash ponds but are not captured by an engineered channel identified pursuant to subsection (b) of this section. For any seep so identified that is believed to not reflect flows from any of the ash ponds, the owner shall provide to the Division of Water Resources the basis for such belief, including hydrological data or water quality testing information. For the seeps from the impoundments, the map will:

(1) Specify its latitude and longitude.

(2) Specify whether the discharge is continuous or intermittent.

(3) Provide an average flow measurement, including a description of the method used to measure flow.

(4) Specify whether the discharge from the seep reaches surface waters.

(5) If the discharge from the seep reaches surface water, identify the location where the seep reaches surface water on the map to include latitude and longitude.

(d) No later than 180 days from the enactment of this act, the owner shall submit a plan to determine whether toe drain or seep discharges from the impoundments have reached surface waters of the state and are causing violations of surface water quality standards. The plan shall include the following:

(1) Sampling locations upstream and downstream within all channels that potentially carry such discharges.

(2) Water quality analyses shall include the same parameters required for a coal-fired power plant per EPA Application Form 2C – Wastewater Discharge Information, Consolidated Permits Program (EPA Form 3510-2C, August 1990).

(3) Frequency and duration of the sampling activities.

(4) Reporting requirements.

No later than 30 days from receipt of the plan, the Division of Water Resources will provide the owner with review comments, either approving the plan, or noting any deficiencies to be corrected and a date by which a corrected plan is to be submitted for further review and comment or approval. Within 180 days from the Division of Water Resources' approval of the plan, the owner will implement and complete the plan and submit a report summarizing that work and its results.

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(e) If the Division of Water Resources determines, based on information submitted pursuant to subsections (b) through (d) of this section, that discharges, whether from toe drains or seeps, are causing a violation of G.S. 143-215.1 or any other law, it shall so notify the owner. Within 120 days of such notification, the owner shall do one of the following:

- (1) Stop the discharge.
- (2) Capture and route the discharge so that it is discharged through an NPDES permitted outfall.
- (3) Address the seep using Best Management Practices approved by the Division of Water Resources pursuant to subsection (f) of this section.
- (4) Propose alternative Best Management Practices subject to the approval of the Division of Water Resources.
- (5) Apply for an NPDES discharge permit or permit amendment to regulate the discharge.

(f) No later than 180 days from the date of enactment of this act, The owner shall submit to the Division of Water Resources for approval a set of best management practices designed to prevent unpermitted discharges of pollutants from the ash ponds to surface waters. Thereafter, the owner may submit additional best management practices for the Division of Water Resources approval.

(g) No later than 30 days from enactment of this act, the owner shall submit to the Division of Water Resources a plan for identifying new seeps on the dike areas of the ash ponds that arise after the submission of the maps described in subsections (b) and (c) of this section. The plan shall include, at a minimum, the following elements:

- (1) A procedure for routine inspection of the coal combustion products impoundment areas to identify indicators of potential new seeps.
- (2) A decision flow chart (including criteria and procedures) for determining whether a new seep is actually present.
- (3) A procedure for notifying the Division of Water Resources after a new seep is confirmed.

No later than 30 days from receipt of the plan, the Division of Water Resources will provide the owner with review comments noting any deficiencies.

(h) No later than 12 months from the enactment of this act, the owner shall submit any information, forms, and fees necessary to request that the Division of Water Resources incorporate the process described in subsections (b) through (g) of this section into the owner's NPDES permit."

PART IV. AMEND S.L. 2009-390 (SB 1004)

SECTION 4. Section 3.(b) of S.L. 2009-390 is repealed.

PART V. EMERGENCY ACTION PLANS

SECTION 5. G.S. 143-215.31 is amended by adding two subsections to read:

"§ 143-215.31. Supervision over maintenance and operation of dams.

...

(f) Develop Emergency Action Plan. – Owners of high and intermediate hazard dams shall develop at their cost an Emergency Action Plan for their dam in document format in triplicate copy to be submitted to the Department by January 1, 2015. The emergency action plan at minimum shall:

- (1) Identify potential emergency conditions that can occur at the dam.
- (2) List preplanned actions to be taken during an emergency condition at the dam.
- (3) Document emergency notification procedures to aid in warning and evacuations during an emergency condition at the dam.

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- (4) Provide a downstream inundation map depicting areas affected by a dam failure and sudden release of the impoundment.

If a dam owner fails to provide the Department with an Emergency Action Plan in triplicate copy by January 1, 2015, it shall be subject to Enforcement Procedures under G.S. 143-215.36. Dam owners shall update their emergency action plans annually and submit the updated plans in triplicate copy to the Department each year subsequent to January 1, 2015. The Department shall provide the appropriate local Emergency Management Agency and the Regional Office of the Department with the triplicate copy.

(g) Confidentiality of Sensitive Public Security Information – To the extent that any documents included in the Emergency Action Plan developed under this section contain sensitive public security information, those portions of documents shall not be subject to disclosure under the North Carolina Public Records Act."

PART VI. NOTIFICATION OF EMERGENCY REPAIR OF A DAM

SECTION 6. G.S. 143-215.27 reads as rewritten:

"§143-215.27. Repair, alteration, or removal of dam.

(a) Before commencing the repair, alteration or removal of a dam, application shall be made for written approval by the Department, except as otherwise provided by this Part. The application shall state the name and address of the applicant, shall adequately detail the changes it proposes to effect and shall be accompanied by maps, plans and specifications setting forth such details and dimensions as the Department requires. The Department may waive any such requirements. The application shall give such other information concerning the dam and reservoir required by the Department, such information concerning the safety of any change as it may require, and shall state the proposed time of commencement and completion of the work. When an application has been completed it may be referred by the Department for agency review and report, as provided by subsection (b) of G.S. 143-215.26 in the case of original construction.

(b) When repairs are necessary to safeguard life and property they may be started immediately but the Department shall be notified ~~forthwith~~ of the proposed repairs and of the work under ~~way~~ as soon as possible but not later than 24 hours after first knowledge of the necessity for emergency repairs, and ~~they~~ such repairs shall be made to conform to its orders."

PART VII. INSPECTION OF IMPOUNDMENTS

SECTION 7. G.S. 143-215.32 is amended by adding two sections to read:

"(e) Investor-owned public utilities shall inspect each coal combustion products impoundment weekly and after storms to detect evidence of any of the following:

- (1) Deterioration, malfunctions, or improper operation of spillway control systems.
- (2) Sudden drops in the level of the impoundment's contents.
- (3) Severe erosion or other signs of deterioration in dikes or other containment devices.
- (4) New or enlarged seeps along the downstream slope or toe of the dike or other containment devices.
- (5) Any other abnormal conditions at the impoundment that may pose a health or safety risk.

If any abnormalities in subdivisions (1) through (5) of this subsection are observed, documentation shall be provided to a registered professional engineer for further investigation and appropriate action.

(f) Each coal combustion products impoundment located at investor-owned public utilities shall be inspected annually by an independent registered professional engineer to assure structural integrity and that the design, operation, and maintenance of the surface

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impoundment are in accordance with generally accepted engineering standards. The owner or operator must notify the Department by way of a certification by the independent registered professional engineer that the dam is structurally sound and the design, operation, and maintenance of the surface impoundment is in accordance with generally accepted engineering standards. The inspection report shall be submitted to the Department within 30 days of the completion of the inspection and shall be placed on a publicly accessible internet site."

PART VIII. DEFINITION OF SOLID WASTE

SECTION 8.(a) G.S. 130A-290(a)(35) reads as rewritten:

"(35) "Solid waste" means any hazardous or nonhazardous garbage, refuse or sludge from a waste treatment plant, water supply treatment plant or air pollution control facility, domestic sewage and sludges generated by the treatment thereof in sanitary sewage collection, treatment and disposal systems, and other material that is either discarded or is being accumulated, stored or treated prior to being discarded, or has served its original intended use and is generally discarded, including solid, liquid, semisolid or contained gaseous material resulting from industrial, institutional, commercial and agricultural operations, and from community activities. The term does not include:

- a. Fecal waste from fowls and animals other than humans.
- b. Solid or dissolved material in:
 1. Domestic sewage and sludges generated by treatment thereof in sanitary sewage collection, treatment and disposal systems which are designed to discharge effluents to the surface waters.
 2. Irrigation return flows.
 3. Wastewater discharges and the sludges incidental to and generated by treatment which are point sources subject to permits granted under Section 402 of the Water Pollution Control Act, as amended (P.L. 92-500), and permits granted under G.S. 143-215.1 by the Environmental Management Commission. However, any combustion products removed from impoundments subject to permits under Section 402 of the Water Pollution Control Act, as amended (P.L. 92-500), and permits granted under G.S. 143-215.1 by the Environmental Management Commission shall be a solid waste. Any sludges that meet the criteria for hazardous waste under RCRA shall also be a solid waste for the purposes of this Article.
- c. Oils and other liquid hydrocarbons controlled under Article 21A of Chapter 143 of the General Statutes. However, any oils or other liquid hydrocarbons that meet the criteria for hazardous waste under RCRA shall also be a solid waste for the purposes of this Article.
- d. Any source, special nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended (42 U.S.C. § 2011).
- e. Mining refuse covered by the North Carolina Mining Act, G.S. 74-46 through 74-68 and regulated by the North Carolina Mining and Energy Commission (as defined under G.S. 143B-293.1). However, any specific mining waste that meets the criteria for hazardous waste under RCRA shall also be a solid waste for the purposes of this Article.

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f. Recovered material."

SECTION 8.(b) G.S. 143-213(18) reads as rewritten:

"(18) "Waste" shall mean and include the ~~following~~ following with the exception of solid waste as defined by G.S. 130A-290(a)(35):

- a. "Sewage," which shall mean water-carried human waste discharged, transmitted, and collected from residences, buildings, industrial establishments, or other places into a unified sewerage system or an arrangement for sewage disposal or a group of such sewerage arrangements or systems, together with such ground, surface, storm, or other water as may be present.
- b. "Industrial waste" shall mean any liquid, solid, gaseous, or other waste substance or a combination thereof resulting from any process of industry, manufacture, trade or business, or from the development of any natural resource.
- c. "Other waste" means sawdust, shavings, lime, refuse, offal, oil, tar chemicals, dissolved and suspended solids, sediment, and all other substances, except industrial waste, sewage, and toxic chemicals which may be discharged into or placed in such proximity to the water that drainage therefrom may reach the water.
- d. "Toxic waste" means that waste, or combinations of wastes, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformities, in such organisms or their offspring."

PART IX. TEMPORARY MORATORIUM ON STRUCTURAL FILL

SECTION 9.(a) Moratorium Established. – Notwithstanding rules adopted by the Commission for Public Health there is hereby established a moratorium on the use of coal combustion products as a structural fill unless the fill is used under an airport runway or base or sub-base of a concrete or asphalt paved road, constructed under the authority of a public entity. The moratorium established by this section shall be in effect until rules are amended by the Commission for Public Health for the management of coal combustion products.

SECTION 9.(b) For purposes of this section, the moratorium does not apply to structural fill sites of less than 5,000 cubic yards.

SECTION 9.(c) This section is effective when this act becomes law and applies only to those coal combustion products structural fills that have not begun construction or have not received a permit to begin construction on or before that date.

PART X. COAL COMBUSTION PRODUCTS IMPOUNDMENT CLOSURE

SECTION 10.(a) Article 21 of Chapter 143 of the General Statutes is amended by adding a new Part to read:

"Part 12. Coal Combustion Products Impoundment Closure

§ 143-215.74Q. Closure of Coal Combustion Products Impoundments to Protect Groundwater and Surface Water

(a) The Department shall establish the priority for closure of all active and inactive investor-owned coal combustion products impoundments. Once priorities for closure are established, the owner of the active and inactive ash ponds shall propose a schedule for beginning closure activities for each prioritized facility, and shall submit a proposed schedule

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in accordance with the time frame established by the Department. Six months (180 days) before the scheduled closure activities begin, the owner must submit five (5) paper copies and one (1) electronic copy of a closure plan to the Division of Water Resources for approval. The closure plan shall include the following sections:

- (1) Facility and Ash Pond Description. – A description of the operation of the facility that shall include, but not be limited to:
 - a. Site and history of site operations; ash handling and storage operations.
 - b. Types of flows discharging into the impoundment.
 - c. Estimated volume of material contained in the impoundment.
 - d. Analysis of the structural integrity of dikes or dams associated with impoundment.
 - e. Composition of liner (lined or unlined pond).
 - f. Summarized results of any previous environmental investigations performed at the site.
- (2) Site Map. – Site maps that illustrate the following:
 - a. All structures associated with operations of the ash ponds within the power plant property boundary.
 - b. All identified current and former ash disposal and storage areas including structural fills.
 - c. All property boundaries and established compliance boundaries.
 - d. All potential receptors (i.e. water supply wells, surface water bodies (streams, springs, lakes, ponds and other surface drainage features, and wetlands) within 2,640 feet from the compliance boundary.
 - e. Topographic contour intervals of the site shall be selected to enable an accurate representation of site features and terrain and in most cases should be less than 20 feet intervals.
 - f. Locations of all on-site active and inactive Division of Waste Management permitted solid waste facilities along with their associated compliance boundaries and monitoring wells.
 - g. All existing and proposed groundwater monitoring wells associated with monitoring of the active and inactive ash ponds.
 - h. All existing and proposed sample collection locations associated with the operation or closure of the impoundment(s).
- (3) Hydrogeologic, Geologic, and Geotechnical Investigations. – The results of a hydrogeologic, geologic, and geotechnical investigation of the facility, that shall include, but not be limited to:
 - a. A description of the hydrogeology and geology of the site.
 - b. A description of the stratigraphy of the geologic units underlying the ash ponds.
 - c. The saturated hydraulic conductivity for the ash and liner if present.
 - d. The geotechnical properties for the ash, liner if present, and the uppermost identified stratigraphic unit underlying the impoundment including the soil classification by Unified Soil Classification System, in-place moisture content, particle size distribution, Atterberg limits, specific gravity, effective friction angle, maximum dry density, optimum moisture content, and permeability.
 - e. A chemical analysis of the impoundment water, ash, and ash-affected soil. Identify constituents with concentrations found to be in excess of 15A NCAC 02L. 0202 Groundwater Quality Standards including all laboratory results for these analyses.

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- 1 f. Summary tables of historical records of groundwater sampling
2 results.
- 3 g. A map that illustrates the potentiometric contours and flow directions
4 for all identified aquifers underlying impoundments (shallow,
5 intermediate, and deep) and the horizontal extent of areas where 15A
6 NCAC 02L. 0202 Groundwater Quality Standards are exceeded.
- 7 h. Cross-sections that illustrate the following: vertical and horizontal
8 extent of the ash within the impoundment; Stratigraphy of the
9 geologic units underlying the ash pond and the vertical extent of
10 areas where 15A NCAC 02L. 0202 Groundwater Quality Standards
11 are exceeded.
- 12 (4) Hydrogeologic Modeling. – The results of groundwater modeling of the site
13 that shall include, but not be limited to:
- 14 a. An account of the design of the proposed pond closure method that:
15 is based on the site hydrogeologic conceptual model developed,
16 includes predictions on post-closure groundwater elevations,
17 groundwater flow directions and velocities including the effects
18 on/from the potential receptors, and includes predictions at the
19 compliance boundary for constituents identified in subsubdivision e.
20 of subdivision (3) of this subsection as exceeding 15A NCAC 2L
21 .0202 Groundwater Quality Standards.
- 22 b. Predictions that include the effects on the groundwater chemistry,
23 and should describe migration, concentration, mobilization and fate
24 of the constituents that exceed 15A NCAC 2L standards before and
25 after closure activities including the effects on/from potential
26 receptors.
- 27 c. A description of the groundwater trend analysis methods used to
28 demonstrate compliance with 15A NCAC 02L .0202 Groundwater
29 Quality Standards and 15A NCAC 02L .0106.
- 30 (5) Closure Method. – The owner shall provide a proposed closure method. The
31 proposed closure method must demonstrate that where groundwater quality
32 is degraded, restoration to the level of the groundwater standards will be
33 obtained as is economically and technically feasible. The selected proposed
34 closure method shall be from one of the following alternatives, and shall
35 include, but not be limited to:
- 36 a. A description of the closure method identified for each ash pond.
37 Closure methods include:
- 38 i. Closure-in-Place. – This alternative entails placing an
39 engineered cover system such as a composite geomembrane,
40 impermeable clay, and/or a soil cover over the ash pond. No
41 ash or ash-affected soil would leave the ash pond area.
- 42 ii. Clean Closure. – This alternative assumes that all coal ash
43 can be excavated and the ash pond area will be returned to a
44 non-erosive and stable condition.
- 45 iii. Hybrid Closure. – This alternative entails consolidating ash
46 and ash-affected soil into as small area as feasible within the
47 ash pond footprint. An engineered cover system (e.g.
48 composite geomembrane, impermeable clay, and/or a soil
49 cover) would be installed over the consolidated ash and
50 ash-affected soil. The remaining ash pond area will be
51 returned to a non-erosive and stable condition.

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- 1 (8) Future Site Use. – The owner shall describe the anticipated future use of the
 2 site and the necessity for deed restrictions following closure.
 3 (9) Final Submittal Determination and Approval. – Within 90 days of receipt of
 4 a completed closure plan, the Department will send a letter either approving
 5 the closure plan or requesting additional information. Upon approval, the
 6 owner must begin closure activities within 30 days."

7 **SECTION 10.(b)** Part 3 of Article 21 of Chapter 143 of the General Statutes is
 8 amended by adding a new section to read:

9 **"§ 143-215.37A. Closure of coal combustion products impoundments to render such**
 10 **facilities exempt from the North Carolina Dam Safety Law of 1967.**

11 (a) Decommissioning Request Submittal. – Any party seeking to decommission a coal
 12 combustion products impoundment facility shall submit a document from the ownership entity
 13 requesting that the facility be decommissioned to the Division of Energy, Mineral, and Land
 14 Resources. The document shall include as a minimum the following:

- 15 (1) A proposed geotechnical investigation plan scope of work. Upon preliminary
 16 plan approval as described below, the owner shall proceed with necessary
 17 field work and submit a geotechnical report with site specific field data
 18 indicating that the containment dam and material impounded by the
 19 containment dam are stable, and that the impounded material is not subject
 20 to liquid flow behavior under expected static and dynamic loading
 21 conditions. Material testing should be performed along the full extent of the
 22 containment dam and in a pattern throughout the area of impounded
 23 material.
 24 (2) A topographic map depicting existing conditions of the containment dam
 25 and impoundment area at two foot contour intervals or less.
 26 (3) If the facility contains areas capable of impounding by topography, a breach
 27 plan must be included which ensures that there shall be no place within the
 28 facility capable of impounding. The breach plan shall include at minimum
 29 proposed grading contours superimposed on the existing topographic map as
 30 well as necessary engineering calculations, construction details and
 31 construction specifications.
 32 (4) A permanent vegetation and stabilization or capping plan by synthetic liner
 33 or other means if needed. These plans shall include at minimum, proposed
 34 grading contours superimposed on the existing topographic map where
 35 applicable as well as necessary engineering calculations, construction
 36 details, construction specifications and all details for the establishment of
 37 surface area stabilization.
 38 (5) A statement indicating that the impoundment facility has not received
 39 sluiced coal ash material for at least three years and there are no future plans
 40 to place coal ash in the facility by sluicing methods.
 41 (b) Preliminary Submittal Determination and Approval. – The submitted document
 42 shall undergo a preliminary review by the Division of Energy, Mineral, and Land Resources for
 43 completeness and approval of the proposed geotechnical investigation plan scope of work.
 44 (1) The owner shall be notified by letter with results of the preliminary review
 45 including approval or revision request relative to the proposed scope of work
 46 included in the geotechnical investigation plan.
 47 (2) Upon receipt of a letter issued by the Division approving the preliminary
 48 geotechnical plan scope of work, the owner may proceed with field work
 49 and development of the geotechnical report.

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(c) Final Submittal Determination and Approval. – Upon receipt of the geotechnical report, the Division of Energy, Mineral, and Land Resources shall complete the submittal review.

- (1) If it is determined that sufficient evidence has been presented to clearly show that the facility no longer functions as a dam in its current state, a letter decommissioning the facility shall be issued by the Division of Energy, Mineral, and Land Resources and the facility shall no longer be under jurisdiction of the Dam Safety Law of 1967, G.S. 143-215.23.
- (2) If modifications such as breach construction and/or implementation of a permanent vegetation or surface lining plan are needed, such plans shall be reviewed per standard procedures for consideration of letter of approval to modify and/or breach.
- (3) If approved, such plans shall follow standard procedure for construction including: construction supervision by a North Carolina registered professional engineer, as-built submittal by a North Carolina registered professional engineer, and follow up final inspection by Division of Energy, Mineral, and Land Resources staff.
- (4) Final approval shall be issued by the Division of Energy, Mineral, and Land Resources in the form of a letter decommissioning the facility and the facility shall no longer be under jurisdiction of the Dam Safety Law of 1967, G.S. 143-215.23."

PART XI. CLOSURE PLANS SCHEDULE

SECTION 11. Notwithstanding G.S. 143-215.74Q and G.S. 143-215.37A as enacted by Sections 10.(a) and 10.(b) of this act:

- (a) The closure plan for Riverbend shall be submitted to the Department no later than 60 days after the Act is ratified and shall include detailed provisions that ensure all ash in the impoundments will be moved to a lined structural fill, a lined landfill, or an alternative disposition approved by Department.
- (b) The closure plan for Asheville shall be submitted to the Department no later than 60 days after the Act is ratified and include detailed provisions that ensure all ash in the impoundments will be moved to a lined structural fill, a lined landfill, or an alternative disposition approved by the Department.
- (c) The closure plan for Dan River shall be submitted to the Department no later than 90 days after the Act is ratified and include detailed provisions that ensure all ash in the impoundments will be moved to a lined structural fill, a lined landfill, or an alternative disposition approved by the Department.
- (d) The closure plan for Sutton shall be submitted to the Department no later than 90 days after the Act is ratified, and include detailed provisions that ensure all ash in the impoundments will be moved to a lined structural fill, a lined landfill, or an alternative disposition approved by Department.

PART XII. APPROPRIATION

SECTION 12. There is appropriated from the General Fund to the Department of Environment and Natural Resources the sum of one million four hundred thousand dollars (\$1,400,000) for the 2013-2014 Fiscal Year to establish nineteen permanent positions and associated operating costs to implement this act."

PART XIII. EFFECTIVE DATE

SECTION 13. This act is effective when it becomes law.

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**SENATE BILL 716
Commerce Committee Substitute Adopted 5/21/15
PROPOSED HOUSE COMMITTEE SUBSTITUTE S716-PCS45379-TD-36**

Short Title: Mountain Energy Act of 2015.

(Public)

Sponsors:

Referred to:

May 20, 2015

A BILL TO BE ENTITLED

AN ACT TO: (1) DIRECT THE NORTH CAROLINA UTILITIES COMMISSION TO RENDER AN EXPEDITED DECISION, UNDER CERTAIN CONDITIONS, ON AN APPLICATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR AN APPLICANT TO CONSTRUCT A GENERATING FACILITY THAT USES NATURAL GAS AS THE PRIMARY FUEL AND (2) MODIFY CERTAIN REQUIREMENTS UNDER THE COAL ASH MANAGEMENT ACT OF 2014 FOR COAL ASH SURFACE IMPOUNDMENTS LOCATED ON SITES AT WHICH ALL COAL-FIRED GENERATING UNITS PRESENT ON THOSE SITES WILL PERMANENTLY CEASE OPERATIONS BY JANUARY 31, 2020.

The General Assembly of North Carolina enacts:

SECTION 1. Notwithstanding G.S. 62-110.1, the Commission shall provide an expedited decision on an application for a certificate to construct a generating facility that uses natural gas as the primary fuel if the application meets the requirements of this section. A public utility shall provide written notice to the Commission of the date the utility intends to file an application under this section no less than 30 days prior to the submission of the application. When the public utility applies for a certificate as provided in this section, it shall submit to the Commission an estimate of the costs of construction of the gas-fired generating unit in such detail as the Commission may require. G.S. 62-110.1(e) and G.S. 62-82(a) shall not apply to a certificate applied for under this section. The Commission shall hold a single public hearing on the application applied for under this section and require the applicant to publish a single notice of the public hearing in a newspaper of general circulation in Buncombe County. The Commission shall render its decision on an application for a certificate, including any related transmission line located on the site of the new generation facility, within 45 days of the date the application is filed if all of the following apply:

- (1) The application for a certificate is for a generating facility to be constructed at the site of the Asheville Steam Electric Generating Plant located in Buncombe County.
- (2) The public utility will permanently cease operations of all coal-fired generating units at the site on or before the commercial operation of the generating unit that is the subject of the certificate application.
- (3) The new natural gas-fired generating facility has no more than twice the generation capacity as the coal-fired generating units to be retired.

SECTION 2.(a) Section 3(b) of S.L. 2014-122 reads as rewritten:



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"**SECTION 3.(b)** Notwithstanding G.S. 130A-309.211 or G.S. 130A-309.212, as enacted by Section 3(a) of this act, and except as otherwise preempted by the requirements of federal law, the following coal combustion residuals surface impoundments shall be deemed high-priority ~~and, as soon as practicable, but no later than August 1, 2019,~~ and shall be closed in conformance with Section 3(c) of this act as follows:

- (1) Coal combustion residuals surface impoundments located at the Dan River Steam Station, owned and operated by Duke Energy Progress, and located in Rockingham ~~County~~-County, as soon as practicable, but no later than August 1, 2019.
- (2) Coal combustion residuals surface impoundments located at the Riverbend Steam Station, owned and operated by Duke Energy Carolinas, and located in Gaston ~~County~~-County, as soon as practicable, but no later than August 1, 2019.
- (3) Coal combustion residuals surface impoundments located at the Asheville Steam Electric Generating Plant, owned and operated by Duke Energy Progress, and located in Buncombe ~~County~~-County, as soon as practicable, but no later than August 1, 2022.
- (4) Coal combustion residuals surface impoundments located at the Sutton Plant, owned and operated by Duke Energy Progress, and located in New Hanover ~~County~~-County, as soon as practicable, but no later than August 1, 2019."

SECTION 2.(b) The requirements of subsections (c) through (f) of G.S. 130A-309.210 shall not apply to coal combustion residuals surface impoundments and electric generating facilities located at the Asheville Steam Electric Generating Plant in Buncombe County.

SECTION 2.(c) This section becomes effective August 1, 2016, if, on or before that date, the North Carolina Utilities Commission has issued a certificate of public convenience and necessity to Duke Energy Progress for a new natural gas-fired generating facility, pursuant to Section 1 of this act, based upon written notice submitted to the Commission from Duke Energy Progress that it will permanently cease operations of all coal-fired generating units at the Asheville Steam Electric Generating Plant located in Buncombe County no later than January 31, 2020.

SECTION 3. Except as otherwise provided, this act is effective when it becomes law.